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SMALL ICBM AREA NARROWING REPORT

VOLUME I  
HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
BASING MODE

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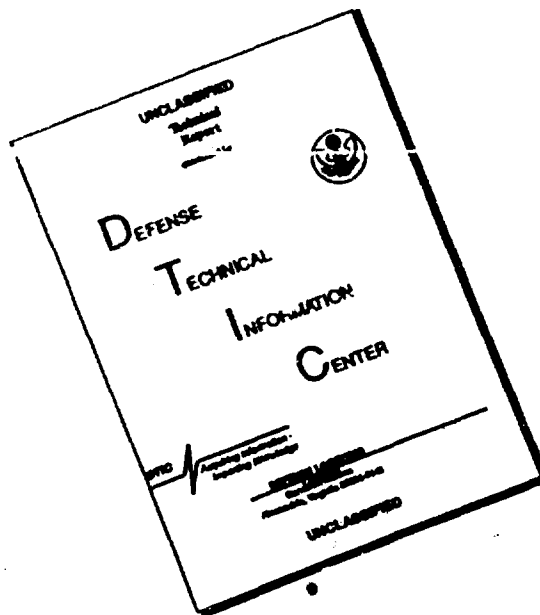
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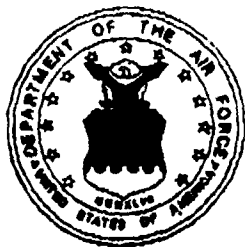
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SMALL ICBM  
AREA NARROWING REPORT

VOLUME I:

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
BASING MODE

JANUARY 1986

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## PREFACE

In accordance with Congressional and Presidential direction, the United States Air Force proposes to enter full scale development and select deployment areas in late 1986 for the Small ICBM weapon system. The deployment area selection will be supported by a Legislative Environmental Impact Statement (LEIS).

This Area Narrowing Report identifies the alternative deployment areas to be analyzed in the LEIS. It also documents the Comprehensive Siting Analysis Process through which potential locations were eliminated from consideration.

This Area Narrowing Report comprises an Executive Summary and three volumes. Volumes I, II, and III discuss Hard Mobile Launcher in Random Movement, Hard Mobile Launcher at Minuteman Facilities, and Hard Silo in Patterned Array, respectively.

Each of these volumes is structured the same. Section 1 provides the background and policies of the Small ICBM program. Section 2 contains system and operations descriptions. Section 3 provides an overview of the Comprehensive Siting Analyses Process. Sections 4 and 5 describe the application and results of the Exclusionary and Evaluative Criteria, respectively. Section 6 identifies the geographic areas not eliminated by the siting process.

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Appendices are included with each volume to provide more detailed information, such as the identification of United States military installations considered not suitable for the Small ICBM mission, descriptions of the Exclusionary and Evaluative Criteria, and how each potential main operating base and deployment installation fulfills the criteria.

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1.0 INTRODUCTION

1.1 PURPOSE OF DOCUMENT

The purpose of this report is to identify those areas that could potentially support deployment of the Small Intercontinental Ballistic Missile (ICBM) utilizing basing modes presently considered viable: the Hard Mobile Launcher in Random Movement, the Hard Mobile Launcher at Minuteman Facilities, and the Hard Silo in Patterned Array. Specifically, this report describes the process and the rationale supporting the application of Exclusionary and Evaluative Criteria and lists those locations that were eliminated through the application of these criteria. The remaining locations will be the subject of further investigations.

The report is divided into an executive summary and three separate volumes, one for each basing mode. Each volume presents an overview of system description; technical, operational, legal, and policy siting criteria; and potential locations remaining as a result of this analytical process. Volume I discusses Hard Mobile Launcher in Random Movement, Volume II discusses Hard Mobile Launcher at Minuteman Facilities, and Volume III discusses Hard Silo in patterned Array. Each of the three volumes also includes appendices, which contain the goals, objectives, and rationale for each criterion, and an evaluation of the candidate locations for that basing mode.

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This particular volume describes the application of the Exclusionary and Evaluative Criteria to the Hard Mobile Launcher in Random Movement concept. The appendices for this volume present the definition and rationale for each of the Exclusionary and Evaluative Criteria, and an evaluation of each of the candidate locations for the Hard Mobile Launcher in Random Movement basing mode.

1.2 BACKGROUND

1.2.1 Policy/Direction

The President established the bipartisan Commission on Strategic Forces (Scowcroft Commission) in January 1983 to study the nation's strategic needs. The Commission concluded that the land-based portion of the TRIAD should be upgraded. Specifically, the Commission recommended the development of a Small ICBM. The President accepted this and other recommendations in the Commission's report.

The Glenn Amendment to the 1984 Department of Defense (DoD) Authorization Act directed an Initial Operational Capability for the Small ICBM of 1992 or earlier. The amendment also directed that "...the design, development, and testing of a small, mobile, single warhead intercontinental ballistic missile be pursued as a matter of the highest national priority."

Acting on the Presidential decision and Congressional direction, the Air Force initiated engineering design,

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siting, and environmental planning in support of a small, single warhead missile.

1.2.2 Schedule

A schedule for system siting and environmental analysis is presented in Figure 1-1. Key milestones are: Full Scale Development decision (which includes basing mode selection) and Deployment Area selection, late 1986; Site Specific decision, early 1988; and Initial Operational Capability, late 1992.

1.3 ENVIRONMENTAL IMPACT AND SITING ANALYSIS PROCESS

The National Environmental Policy Act requires environmental documentation to aid the deployment area and site-specific facility decisions. To correlate the detail of decisions with system development progress and for efficiencies in cost and schedule, a tiered approach to these decisions will be used. The Comprehensive Siting Analysis process supports tiered decision making by providing progressively more specific location alternatives for environmental analysis.

The first tier involves the deployment area selection and basing mode decision. The FY 86 DoD Authorization Act directed that the environmental documentation to aid these decisions be prepared in accordance with the procedures established in the Council on Environmental Quality Regulations for a Legislative Environmental Impact Statement (LEIS).

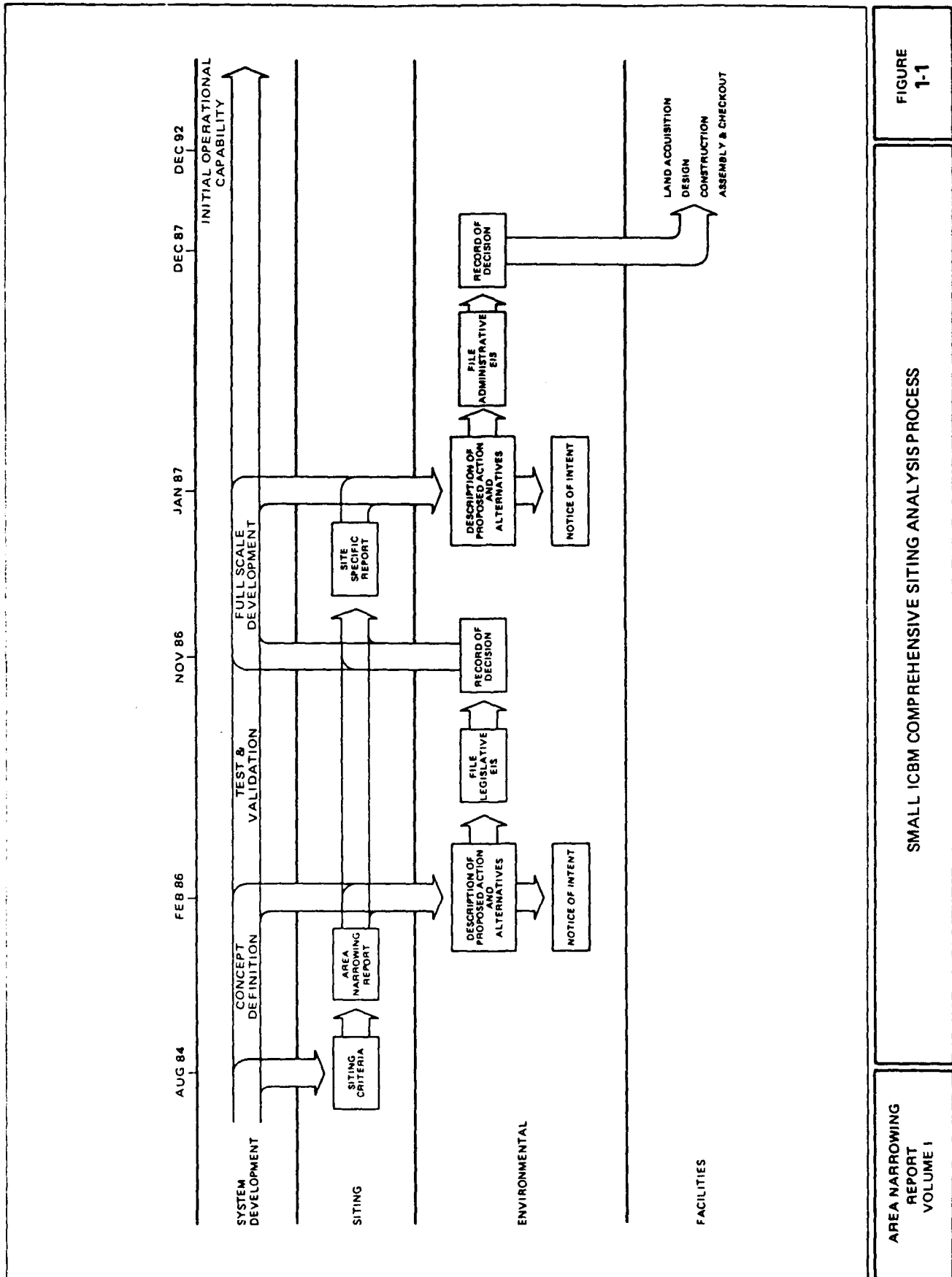


FIGURE 1-1

SMALL ICBM COMPREHENSIVE SITING ANALYSIS PROCESS

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The second tier of decisions requiring environmental documentation involves facility site decisions. The Congress has directed that Administrative Environmental Impact Statements (EIS) be prepared to aid these decisions. Environmental documentation will be prepared in time to allow necessary land acquisition, design, construction, and assembly and check-out actions to meet the Initial Operational Capability date of late 1992.

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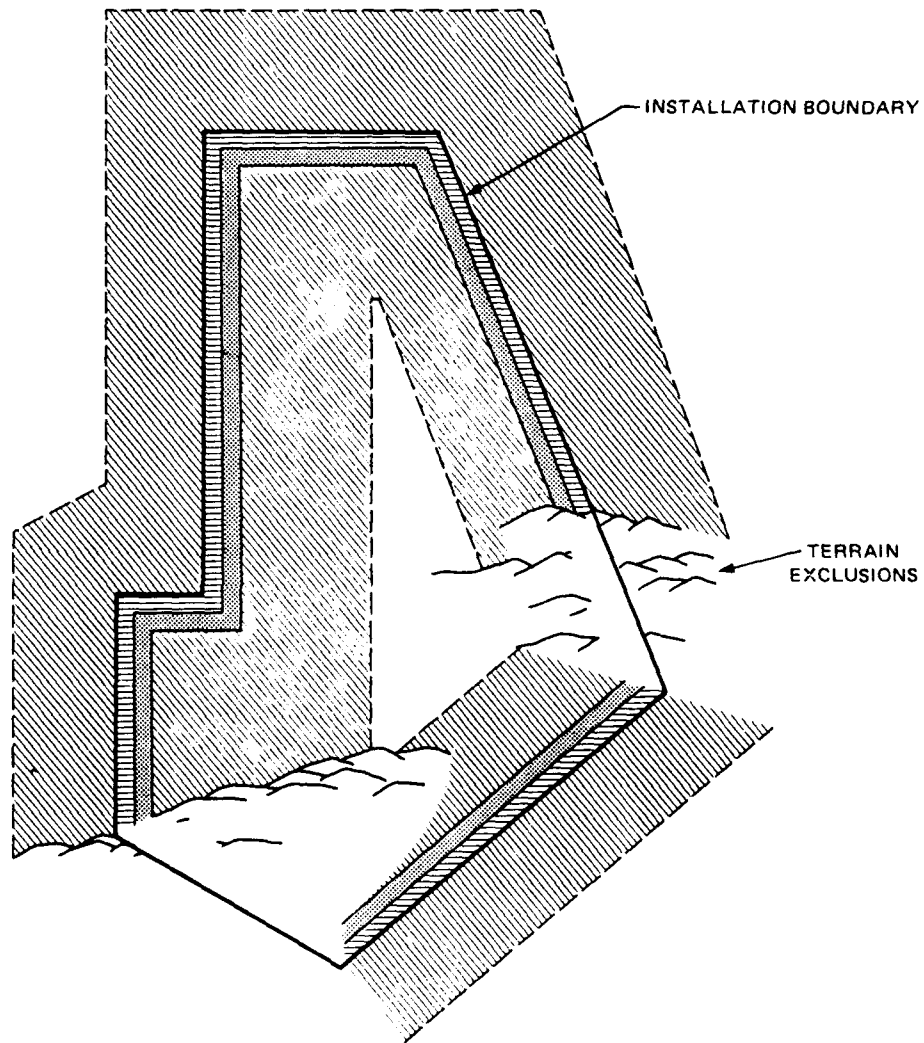
2.0 HARD MOBILE LAUNCHER IN RANDOM MOVEMENT SYSTEM CONCEPT

2.1 SYSTEM DESCRIPTION




The Small ICBM Hard Mobile Launcher in Random Movement basing mode employs missile-carrying mobile launcher vehicles randomly dispersed over Department of Defense and Department of Energy land. The survivability of the Hard Mobile Launcher system is a function of the vehicle hardness and mobility. Each mobile launcher is "hardened" to withstand high levels of blast and radiation. Vehicle positions are changed frequently enough to deny an attacker useful knowledge of specific Hard Mobile Launcher locations. Because each Hard Mobile Launcher can be anywhere within an area, the Hard Mobile Launcher in Random Movement system provides stability and contributes to deterrence by complicating the enemy's targeting task.

2.2 OPERATIONAL CONCEPT

The current operational concept employs the strategy of random movement on a day-to-day basis within a deployment area that is large enough to complicate enemy planning and targeting ("random movement area") (Figure 2-1). During times of increased tension, the Hard Mobile Launchers are dispersed over an area approximately twice as large as the day-to-day deployment area ("command dispersal") (Figure 2-1). These areas are contained entirely within federal lands on existing Department of Defense/Department of Energy installations on which public access is restricted. This



EXPLANATION

-  RANDOM MOVEMENT AREA
-  COMMAND DISPERSAL AREA
-  ATTACK DISPERSAL AREA

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concept is consistent with the Scowcroft report, which stated, "... in this context, deployment of a small, single warhead ICBM in hardened mobile launchers is of particular interest because it would permit deployment in peacetime in limited areas such as military reservations." When directed by the Higher Command Authority, the Hard Mobile Launchers can disperse over the largest accessible land areas to increase survivability ("attack dispersal") (Figure 2-1).

Considering projected threats and Hard Mobile Launcher design hardness, sufficient price to attack is achieved by operating a Hard Mobile Launcher on an average of 8 square miles. A minimum of 16 square miles per Hard Mobile Launcher is required for command dispersal during periods of increased tensions.

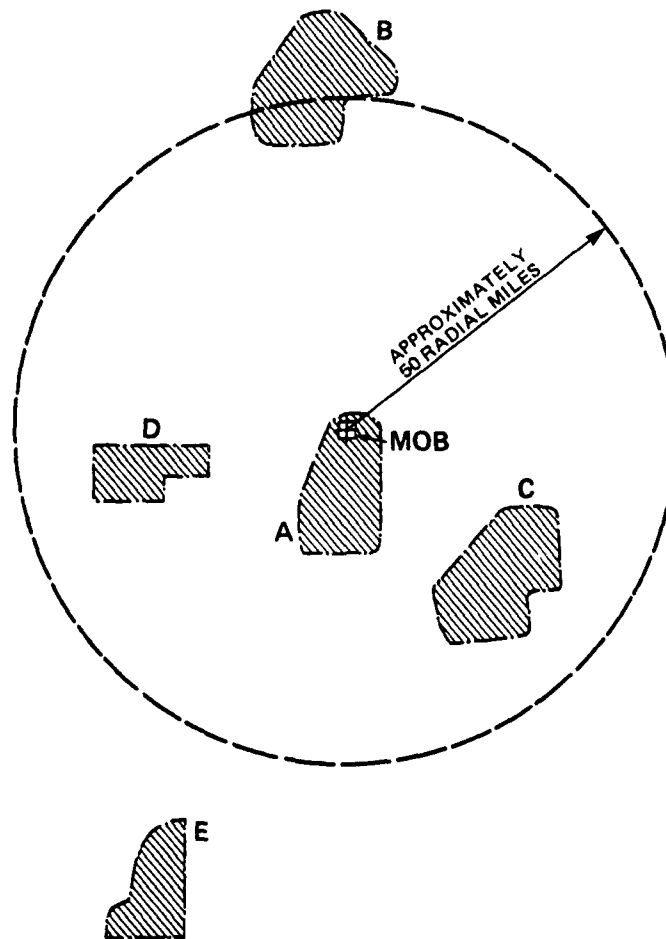
The Hard Mobile Launcher in Random Movement system is deployed in complexes consisting of a Main Operating Base, which maintains the operational capabilities of the Hard Mobile Launcher force, and one or more large Department of Defense/Department of Energy reservations on which Hard Mobile Launchers are deployed. These Department of Defense/Department of Energy reservations are referred to as Candidate Deployment Installations for Hard Mobile Launcher in Random Movement basing.

A Main Operating Base has capabilities beyond those required for systems support of the Hard Mobile Launcher force. For



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example, it may house logistics support activities, family housing, base exchange, commissary, health care facilities, and administrative support activities. Identification of Candidate Main Operating Bases considered the quality of life of the base personnel and the efficiency of maintenance operations. An operating radius of approximately 50 miles from the Main Operating Base to the closest point of the Candidate Deployment Installation is desirable for maintaining efficient deployment area operations (Figure 2-2). Manpower requirement estimates indicate that a minimum of 40 Hard Mobile Launchers should be maintained by a Main Operating Base for efficient maintenance operations.



**MAIN OPERATING BASE AND  
DEPLOYMENT INSTALLATION RELATIONSHIP**

- A, B, C, AND D - POTENTIAL DEPLOYMENT INSTALLATIONS (CLOSEST POINT APPROXIMATELY 50 MILES FROM MAIN OPERATING BASE)
- E CLOSEST POINT SIGNIFICANTLY GREATER THAN 50 MILES FROM MAIN OPERATING BASE (CONSIDERED ONLY IF MAIN OPERATING BASE MET ALL EXCLUSIONARY CRITERIA)

NOTE: MAIN OPERATING BASE MAY OR MAY NOT BE  
CONTIGUOUS WITH DEPLOYMENT INSTALLATION A

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HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
DEPLOYMENT CONCEPT

FIGURE  
2-2

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3.5 COMPREHENSIVE SITING ANALYSIS PROCESS

The Comprehensive Siting Analysis process for Small ICBM area narrowing is a sequential application of Exclusionary and Evaluative Criteria to eliminate unsuitable locations. Each location was evaluated for attainment of key system goals, subgoals, and objectives. Five system goals were defined: maximize system effectiveness, optimize system operability, optimize system practicability, minimize public impact, and minimize environmental impacts.

System effectiveness considers the ability of the weapon system to project a credible deterrent. System operability considers the characteristics, capacity, and ability of an installation's facilities and infrastructure to support a new mission. System practicability considers the costs and technical risks associated with construction in the deployment area. Public impact generally considers people, land use, safety, security, and economic issues.

Environmental impacts considers some of the natural and physical characteristics of an area that could change, be altered, or influenced during Small ICBM system deployment.

Within each of these goals, a hierarchical structure of subgoals and objectives was defined. The criteria were developed to reflect the goals, requirements, capabilities, and constraints of the system and of each basing mode.

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Application of the criteria demonstrates the ability of a location to support the program goals and objectives. While the approach to each level of criteria application was consistent among basing modes, the criteria were not always identical. As a consequence, a given location may have performed well or poorly depending upon the basing mode considered for that location.

### 3.1 EXCLUSIONARY CRITERIA

The first phase in the Area Narrowing process is to eliminate areas that clearly do not meet the minimum requirements of the system. This is accomplished through the application of Exclusionary Criteria, which eliminate from further consideration areas unsuitable for system deployment (see Section 4.0).

Data necessary to support Exclusionary Criteria application were collected and evaluated to identify areas that did not meet system requirements. Locations remained for further study when the level of data and subsequent analysis did not clearly support their elimination. For this reason, at each subsequent phase in the siting process, a more detailed level of data was collected to determine the suitability of those locations that remained.

### 3.2 EVALUATIVE CRITERIA

All locations that meet the requirements of the Exclusionary Criteria are, by definition, suitable locations for

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deployment. The degree of suitability of each location was determined during the second phase of the siting process by the application of Evaluative Criteria (see Section 5.0). The purpose of this phase in the siting process was to eliminate locations determined to be unreasonable.

Evaluative Criteria were applied to those locations under consideration for the Hard Mobile Launcher in Random Movement basing mode that remained after application of Exclusionary Criteria. Each location was evaluated according to its performance against these criteria. Those locations that were determined to be of lower overall suitability were eliminated from further investigation. Those locations that performed better form the basis for further analysis.

### 3.3 SCOPE OF STUDY

Data to support Exclusionary Criteria application were compiled from published documents of federal and state agencies, interpretations of satellite photography, and/or analysis of topographic maps for the Department of Defense/Department of Energy installations. The data were compiled onto overlays registered to topographic base maps to delineate the areal extent of excluded area within the Candidate Deployment Installations. From these maps, suitable siting area was calculated for each Candidate Deployment Installation.

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Application of Evaluative Criteria focused on evaluation of existing conditions and activities at both Main Operating Bases and the Candidate Deployment Installations. Previously compiled data were refined and supplemented with the collection and analysis of additional published documents from federal, state, and local agencies, and satellite imagery interpretation. Data collection visits to the Main Operating Bases and aerial and ground reconnaissance surveys of the Candidate Deployment Installations were also performed. Field data were analyzed to support Main Operating Base evaluations, and a Mission Compatibility Report was prepared to identify possible areas of mission compatibility of the Candidate Deployment Installations with potential Hard Mobile Launcher in Random Movement system operations. The ability of each Main Operating Base and Candidate Deployment Installation to achieve system goals was used to compare and formulate recommendations for Complexes, Candidate Deployment Installations, and Main Operating Bases that require further study.

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### 4.0 APPLICATION OF EXCLUSIONARY CRITERIA

Exclusionary Criteria define the limits of suitability of a location. These criteria were applied to regions of the United States, Deployment Installations, and Main Operating Bases. Alternatives that did not meet each Exclusionary Criterion were eliminated from further analysis.

#### 4.1 EXCLUSIONARY CRITERIA

Of the five system goals originally defined, three were considered to be of critical importance in discriminating among locations at this phase of the siting process. These three goals reflect constraints dictated by system operational and technical requirements and policy and legal considerations. Specifically, these goals are: maximize system effectiveness (Goal 1), optimize system operability (Goal 2), and minimize environmental impacts (Goal 5). The hierarchy of Exclusionary Criteria for these goals is provided in Table 4-1. Specific definitions and rationale for each criterion are in Appendix B.

#### 4.2 APPLICATION

This section describes procedures for and sequence of application of criteria to identify regions, Candidate Deployment Installations, and Candidate Main Operating Bases that meet minimum requirements. Although the Exclusionary Criteria can be distinguished by three levels of

TABLE 4-1 HARD MOBILE LAUNCHER IN RANDOM MOVEMENT EXCLUSIONARY CRITERIA

PAGE 1 of 3

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
1 MAXIMIZE SYSTEM EFFECTIVENESS	1.1 MAXIMIZE SYSTEM SURVIVABILITY	1.1.1 OPTIMIZE PRESERVATION OF HARD MOBILE LAUNCHER LOCATION UNCERTAINTY	1.1.1.A.1 REQUIRE ACCESSIBLE AREA FOR DEPLOYMENT OF HARD MOBILE LAUNCHERS	AREAS WITH LESS THAN OR EQUAL TO 25 PERCENT SLOPE; BLOCKY LAVA FLOWS; SAND DUNES; SURFACE WATER; ADVERSE SOILS
			1.1.1.A.2 MINIMUM REQUIRED COMMAND DISPERSAL AREA	16 SQUARE MILES EFFECTIVE AREA/HARD MOBILE LAUNCHER
			1.1.1.A.3 MINIMIZE TRAVEL DISTANCE FROM MAIN OPERATING BASE TO CANDIDATE DEPLOYMENT INSTALLATION	ROAD MILES FROM MAIN OPERATING BASE TO DEPLOYMENT AREA
1.3 MAXIMIZE RESPONSE CAPABILITY	1.3.1 OPTIMIZE PAYLOAD EFFECTIVENESS/TARGET COVERAGE		1.3.1.A.1 AMBIENT TEMPERATURE RANGE REQUIRED FOR OPERATION OF HARD MOBILE LAUNCHER	NORMAL DAILY SOL-AIR TEMPERATURE GREATER THAN OR EQUAL TO 0°F



TABLE 4-1 HARD MOBILE LAUNCHER IN RANDOM MOVEMENT EXCLUSIONARY CRITERIA

PAGE 2 of 3

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
2 OPTIMIZE SYSTEM OPERABILITY	2.3 MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.1 CONSIDER FUNCTIONAL SUPPORT CAPABILITY	2.3.1.A.1 40 HARD MOBILE LAUNCHERS REQUIRED FOR MINIMUM MAINTENANCE TEAM SIZE	TOTAL EFFECTIVE AREA
			2.3.1.A.2 MINIMUM MAIN OPERATING BASE SIZE TO SUPPORT REQUIRED FACILITIES	MAIN OPERATING BASE AREA GREATER THAN OR EQUAL TO 2/3 SQUARE MILES
			2.3.1.A.3 EXCLUDE MAIN OPERATING BASES WITHIN URBANIZED AREAS	URBANIZED AREA SURROUNDING MAIN OPERATING BASE
			2.3.1.A.4 EXCLUDE INAPPROPRIATE DEPARTMENT OF DEFENSE INSTALLATIONS	SUITABLE EXISTING DEPARTMENT OF DEFENSE INSTALLATIONS
2.4 MAXIMIZE MISSION COMPATIBILITY	2.4.1 MINIMIZE MISSION CONFLICTS	2.4.1.A.4 AVOID MISSION CONFLICT IN CANTONMENT AREA		AREAS USED FOR CURRENT MISSION ACTIVITIES

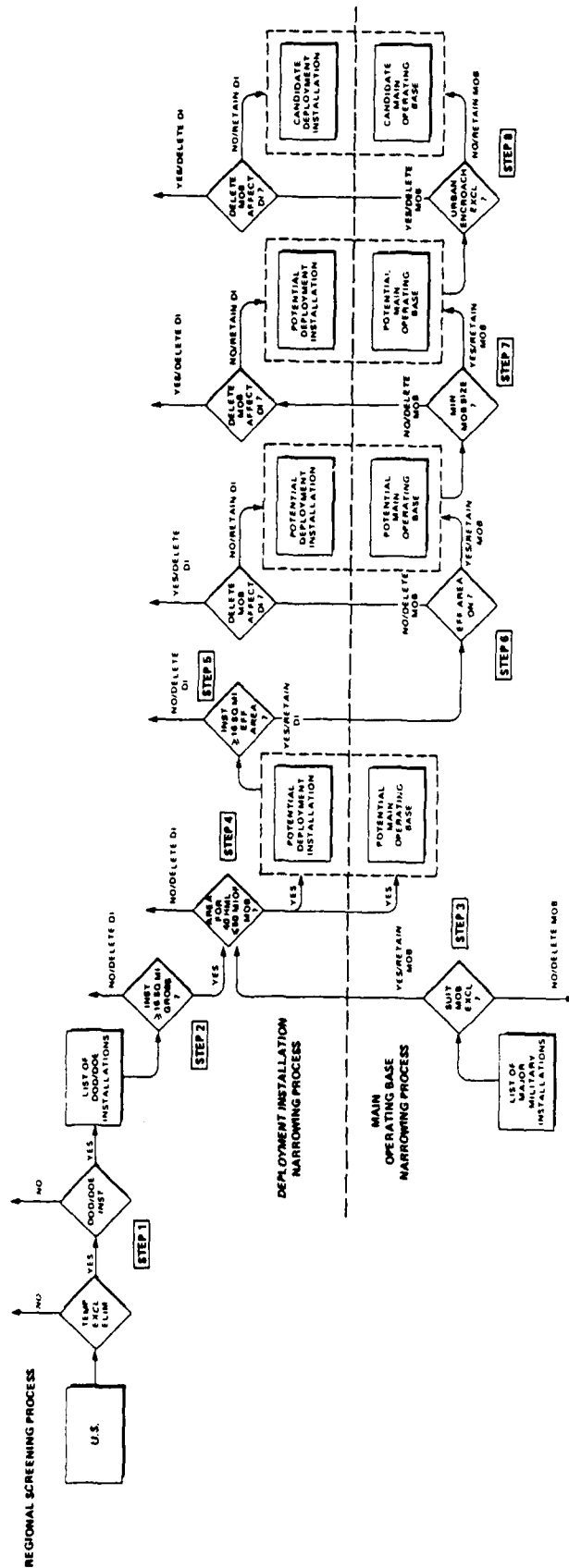
TABLE 4-1 HARD MOBILE LAUNCHER IN RANDOM MOVEMENT EXCLUSIONARY CRITERIA

PAGE 3 of 3

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERION</u>	<u>MEASURE</u>
5 <u>MINIMIZE ENVIRONMENTAL IMPACTS</u>	5.3 <u>MINIMIZE IMPACT ON SPECIAL STATUS LANDS</u>	5.3.1 <u>EXCLUDE LEGAL/REGULATORY EXCLUSION AREAS</u>	5.3.1.A.1 <u>EXCLUDE LANDS WITHIN WILDERNESS AREAS</u>	WILDERNESS AREAS
			5.3.1.A.2 <u>EXCLUDE LANDS WITHIN NATIONAL MONUMENTS</u>	NATIONAL MONUMENTS
			5.3.1.A.3 <u>EXCLUDE LANDS WITHIN NATIONAL RECREATION AREAS</u>	NATIONAL RECREATION AREAS
			5.3.1.A.4 <u>EXCLUDE LANDS WITHIN NATIONAL PARKS</u>	NATIONAL PARKS
			5.3.1.A.5 <u>EXCLUDE LANDS WITHIN WILD/SCENIC RIVER SYSTEM</u>	WILD/SCENIC RIVER SYSTEM AREAS

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geographical concerns, application of these criteria is not as conveniently tiered. The Hard Mobile Launcher in Random Movement deployment concept induces interdependencies among Hard Mobile Launcher deployment installations and between these deployment installations and the Main Operating Bases. These interdependencies are illustrated by the Exclusionary Criterion that requires a deployment installation to be within approximately 50 miles of a Main Operating Base that can support a minimum of 40 Hard Mobile Launchers. Similarly, there is a Main Operating Base Exclusionary Criterion that requires sufficient effective area to support 40 Hard Mobile Launchers on deployment installations within approximately 50 miles. Recognition of these interdependencies is extremely important in the development of a logical sequence of criteria application. For example, eliminating a potential deployment installation may cause the available deployment area within approximately 50 miles of a Main Operating Base to fall below that required to support 40 Hard Mobile Launchers; hence, the Main Operating Base would be eliminated from further consideration. Eliminating this Main Operating Base will remove from consideration each of the potential deployment installations within approximately 50 miles unless the deployment installation is supported by another potential Main Operating Base. This iterative process is diagrammatically represented in Figure 4-1 and explicitly described in Steps 1 through 8 that



**FIGURE 4-1**

## HARD MOBILE LAUNCHER IN RANDOM MOVEMENT CRITERIA APPLICATION SEQUENCE

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follow. The description of the application of the Exclusionary Criteria (Steps 1 through 8) is followed by a series of figures and tables that illustrate which installations meet, and which installations do not meet, the requirements for each criterion.

The sequence of criteria application used in this area narrowing process and their results are as follows:

STEP 1: The Regional Exclusionary Criterion (1.3.1.A.1) requiring that the average normal daily sol-air temperature for any month be at or below 0°F eliminated regions of the conterminous United States (CONUS) and Alaska from consideration for deployment (see Figures 4-2-a and 4-2-b).

STEP 2: Candidate Deployment Installation Exclusionary Criteria requiring that potential deployment areas have federal access restriction controls, not be located on islands or peninsulas (Criterion 4.1.3.A.1), and have a minimum area of 16 square miles (Criterion 1.1.1.A.2), reduced the number of potential deployment installations from approximately 4,200 to 127 Department of Defense/Department of Energy installations with gross area equal to or greater than 16 square miles (see Figure 4-3 and Table 4-2).<sup>1</sup>

STEP 3: The Main Operating Base Exclusionary Criterion requiring that the support area be a suitable Department of Defense installation with existing facilities, narrowed Department of Defense lands to appropriate bases classified by the Department of Defense as major military installations.<sup>1</sup> Results of the application of Exclusionary Criterion 2.3.1.A.4 are listed in Appendix A.

<sup>1</sup>Reference: "Detailed listing of real property owned by the United States and used by the Department of Defense military functions throughout the world as of 30 September 1983." July 1984, United States General Services Administration, Office of Administration.

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- STEP 4: The Main Operating Base Exclusionary Criterion (2.3.1.A.1) requiring deployment of a minimum of 40 Hard Mobile Launchers within approximately 50 miles of potential Main Operating Bases determined which of the 371 suitable major military installations qualify as potential Main Operating Bases (see Appendix A). The results are summarized in Figure 4-4 and Table 4-3. Potential deployment installations with a gross area less than 16 square miles and that cannot meet the area requirement for deployment of 40 Hard Mobile Launchers for each potential Main Operating Base were eliminated (see Figure 4-5 and Table 4-4).
- STEP 5: Application of geotechnical, legal, and policy exclusions (Criteria 1.1.1.A.1, 5.3.1.A.1, 5.3.1.A.2, 5.3.1.A.3, 5.3.1.A.4, 5.3.1.A.5) to refine effective area estimates for potential deployment installations eliminated those that no longer have a minimum of 16 square miles of effective area (see Figure 4-6 and Table 4-5).
- STEP 6: As a result of areas excluded in Step 5, the total effective areas within approximately 50 miles of the potential Main Operating Bases were recalculated. Main Operating Bases with total effective area insufficient to support at least 40 Hard Mobile Launchers were eliminated (see Figure 4-7 and Table 4-6). Those potential deployment installations that would be supported only by the eliminated Main Operating Base were eliminated from further consideration.
- STEP 7: The Main Operating Base Exclusionary Criterion (2.3.1.A.2) eliminated potential Main Operating Bases with less than two-thirds square mile gross area (see Figure 4-8 and Table 4-7). Those potential deployment installations that would be supported only by the eliminated Main Operating Base were eliminated from further consideration.
- STEP 8: The Main Operating Base Exclusionary Criterion (2.1.3.A.3) eliminated those potential Main Operating Base surrounded by an urbanized area (see Figure 4-9 and Table 4-8). Those potential deployment installations that would be supported only by the eliminated Main Operating Base were eliminated from further consideration.

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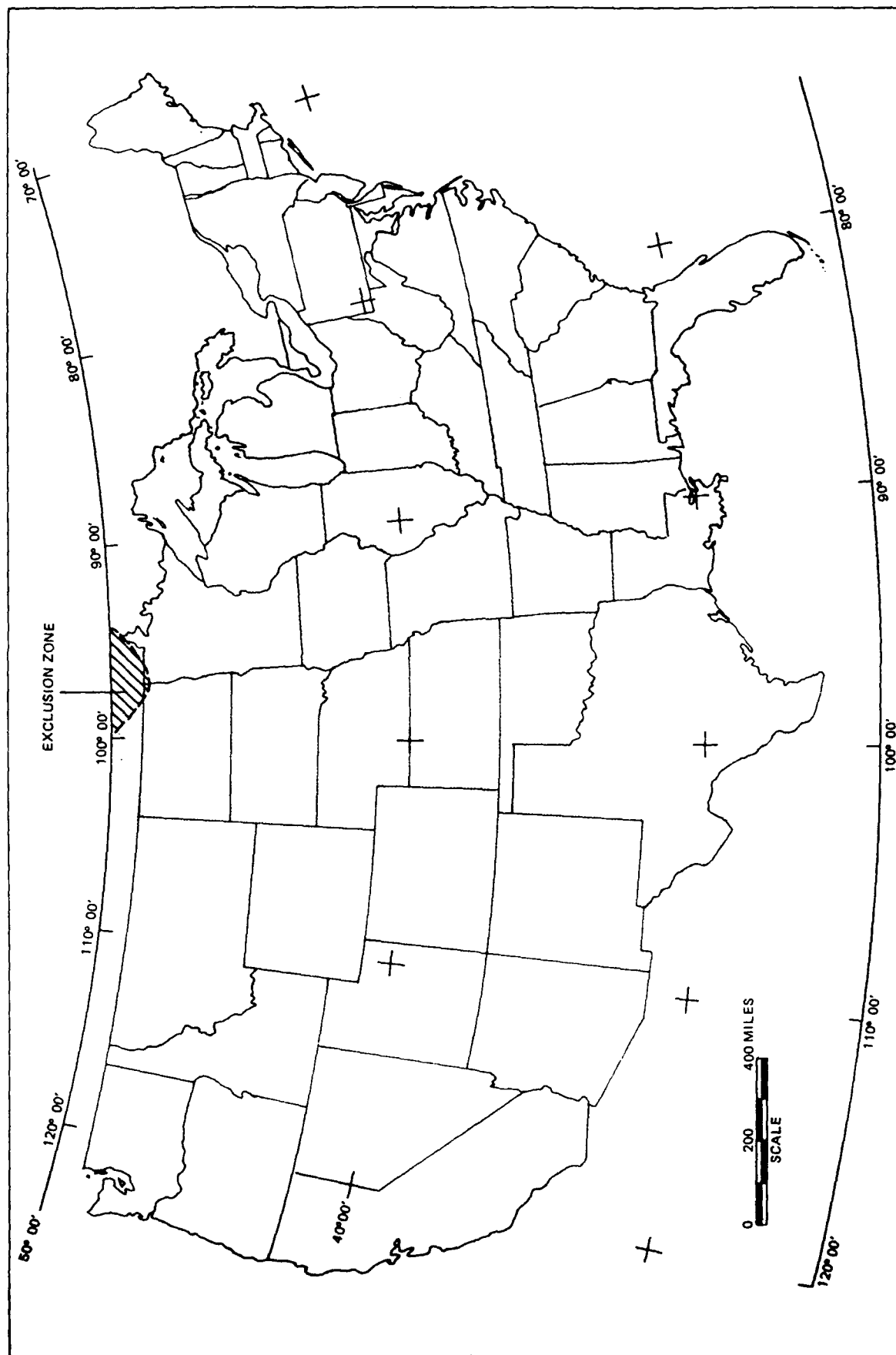


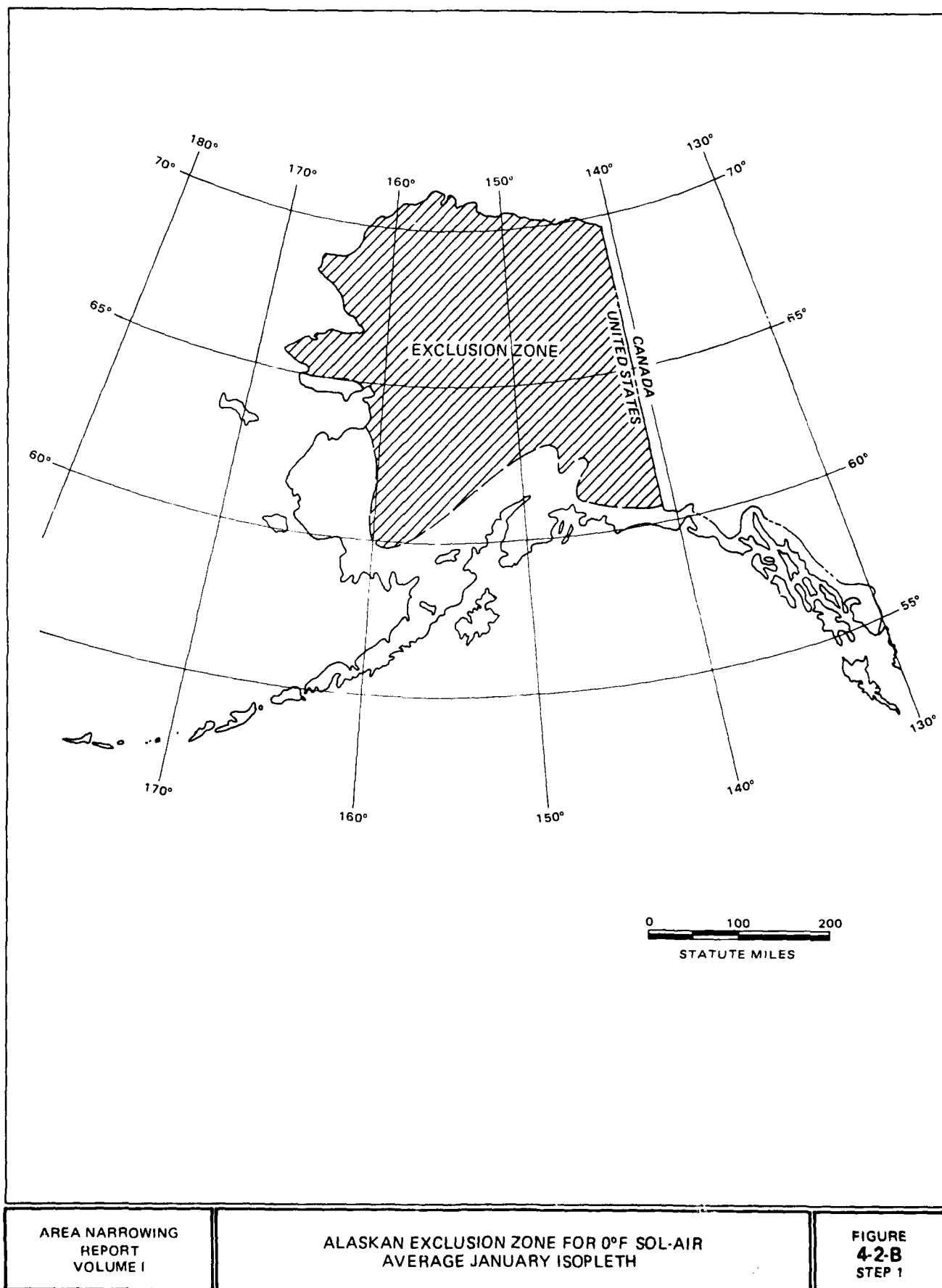
FIGURE  
4-2-A  
STEP 1

CONTINUOUS UNITED STATES EXCLUSION ZONE  
FOR 0° F SOL-A-R AVERAGE JANUARY ISOPLETH

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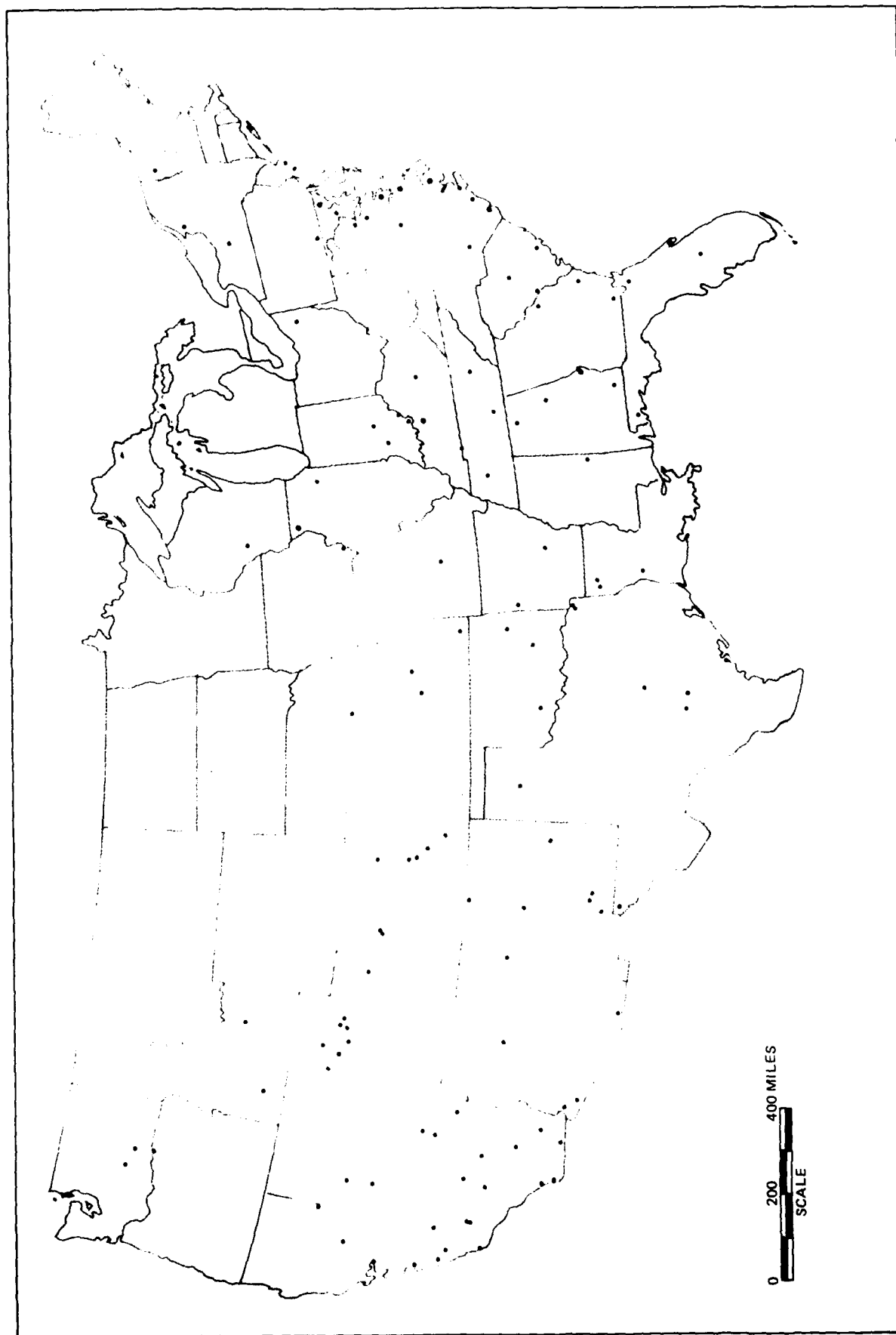


FIGURE  
**4-3**  
STEP 2

POTENTIAL DEPLOYMENT INSTALLATIONS WITH EQUAL TO OR GREATER THAN  
16 SQUARE MILES GROSS AREA

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TABLE 4-2 STEP 2: POTENTIAL DEPLOYMENT INSTALLATIONS WITH EQUAL TO OR GREATER THAN 16 SQUARE MILES GROSS AREA

STATE	INSTALLATION	INSTALLATION SIZE (SQ. MI.)	OPERATING SERVICE	STATE	INSTALLATION	INSTALLATION SIZE (SQ. MI.)	OPERATING SERVICE
AL	ANNISTON ARMY DEPOT	24	ARMY	MD	FORT GEORGE G. MEADE	21	ARMY
AL	FORT MC CLELLAN	64	ARMY	MO	FORT LEONARD WOOD	83	ARMY
AL	FORT RUCKER	90	ARMY	MS	MERIDIAN NAVAL AIR STATION	18	NAVY
AL	REDSTONE ARSENAL	47	ARMY	NC	CAMP LE JEUNE MCB	135	USMC
AR	FORT CHAFFEE	111	ARMY	NC	CHERRY POINT MC AIR STATION	20	USMC
AR	PINE BLUFF ARSENAL	22	ARMY	NC	DARE COUNTY RANGE	73	AF
AR	DAVIS-MONTHAN AIR FORCE BASE	17	AF	NC	FORT BRAGG	204	ARMY
AZ	FORT HUACHUCA	115	ARMY	NC	SUNNY PT. MIL OCEAN TERMINAL	18	ARMY
AZ	LURE AIR FORCE RANGE	4171	AF	NE	CORNHUSKER ARMY AMMO PLANT	19	ARMY
AZ	NAVAJO DEPOT ACTIVITY	44	ARMY	NJ	EARLE WEAPON STATION	17	NAVY
AZ	YUMA PROVING GROUND	1310	ARMY	NJ	FORT DIX	49	ARMY
CA	BEALE AIR FORCE BASE	36	AF	NM	FORT WINGATE DEPOT ACTIVITY	35	ARMY
CA	CAMP PENDLETON MCB	218	USMC	NM	HOLLOWAY AIR FORCE BASE	75	AF
CA	CAMP ROBERTS	168	NAVY	NM	KIETLAND AIR FORCE BASE	82	AF
CA	CHINA LAKE MNC	1714	NAVY	NM	LOS ALAMOS AREA OPC RD	46	DOE
CA	CHOCOLATE MOUNTAIN AGR	718	NAVY	NM	MELROSE AIR FORCE RANGE	35	AF
CA	CONCORD WEAPON STATION	18	NAVY	NM	WHITE SANDS MISSILE RANGE	65	AF
CA	EDWARDS AIR FORCE BASE	470	AF	NM	SACRAMENTO PEAK UARS	3046	ARMY
CA	EL CENTRO NAVAL AIR FACILITY	86	NAVY	NV	FALLON AIR STATION	244	NAVY
CA	FORT HUNTER LIGGETT	257	ARMY	NV	HAMTHORNE AMMO PLANT	230	ARMY
CA	FORT IRWIN NTC	1062	ARMY	NV	NELLIS AIR FORCE BASE	18	AF
CA	FORT ORD	44	ARMY	NV	NELLIS SMALL ARMS ANNEX	4690	AF
CA	LEMOORE NAVAL AIR STATION	29	NAVY	NV	NEVADA TEST SITE	1350	DOE
CA	MCAGCC TWENTYNINE PALMS	932	USMC	NV	FORT DRUM	168	ARMY
CA	MIRAMAR NAVAL AIR STATION	24	NAVY	NY	SENECA ARMY DEPOT	17	ARMY
CA	NORTH ISLAND NAVAL AIR STATION	16	NAVY	NY	RAVENNA ARMY AMMO PLANT	33	ARMY
CA	PET. RESERVE #1, NAVAL	75	DOE	OH	CAMP GRUBER NATL GUARD	41	ARMY
CA	PET. RESERVE #2, NAVAL	16	DOE	OK	FORT SILL	147	ARMY
CA	SIERRA ARMY DEPOT	57	ARMY	OK	MC ALESTER AMMO PLANT	70	ARMY
CA	VANDENBERG AIR FORCE BASE	174	AF	OR	UMATILLA DEPOT ACTIVITY	27	ARMY
CO	ACADEMY, AIR FORCE	29	AF	PA	LETTERKENNY ARMY DEPOT	30	ARMY
CO	FORT CARSON	215	ARMY	SC	CHARLESTON WEAPON STATION	27	NAVY
CO	PET OIL SHALE RES #1, USN	64	DOE	SC	PORT JACKSON	81	ARMY
CO	PET OIL SHALE RES #3, USN	22	DOE	SC	SAVANNAH RIVER PLANT	300	DOE
CO	PINYON CANYON	380	ARMY	SC	ARNOLD AIR FORCE STATION	61	AF
CO	PUEBLO DEPOT ACTIVITY	27	ARMY	TN	MILAN ARMY AMMO PLANT	35	ARMY
CO	ROCKY MOUNTAIN ARSENAL	158	AF	TN	OAK RIDGE OPERATIONS	56	DOE
FL	AVON PARK AIR FORCE RANGE	24	AF	TX	CAMP BULLIS	44	NG
FL	CAPE CANAVERAL AF STATION	31	NAVY	TX	CAMP SWIFT	18	NG
FL	CECIL FIELD AIR STATION	723	AF	TX	FORT BLISS	1750	ARMY
FL	EGLIN AIR FORCE BASE	283	ARMY	TX	PORT HOOD	325	ARMY
GA	FORT BENNING	87	ARMY	TX	LONE STAR AMMO PLANT	24	AF
GA	FORT GORDON	436	ARMY	TX	PANTEX PLANT	16	DOE
GA	FORT STEWART	25	ARMY	TX	RED RIVER ARMY DEPOT	30	ARMY
GA	KINGS BAY SUBMARINE BASE	30	NAVY	TX	CAMP WILLIAMS	36	NG
IA	IONA AMMO PLANT	894	DOE	UT	DUGWAY PROVING GROUND	1246	ARMY
ID	IDAHO NATL ENG. LAB	164	AF	UT	HILL AIR FORCE RANGE	573	AF
ID	SAYLOR CREEK AF RANGE	22	ARMY	UT	PET OIL SHALE RES #2, USN	141	DOE
IL	JOLIET AMMO PLANT	20	ARMY	UT	TOOELE ARMY DEPOT NORTH	39	ARMY
IL	SAVANNA DEPOT	52	ARMY	UT	TOOELE ARMY DEPOT SOUTH	30	ARMY
IN	ATTERBURY RES FORCES / REA	98	NAVY	UT	WENDOVER AIR FORCE RANGE	922	AF
IN	CRANE WEAPONS SUP CENTER	17	ARMY	VA	FORT A.P. HILL	119	ARMY
IN	INDIANA ARMY AMMO PLANT	86	ARMY	VA	FORT PICKETT	70	ARMY
IN	JEFFERSON PROVING GROUND	152	ARMY	VA	OCEANA NAVAL AIR STATION	25	NAVY
KS	KANSAS ARMY AMMO PLANT	21	ARMY	VA	QUANTICO MC DEV & ED CMD	95	USMC
KS	SMOKY HILL ANG RANGE	53	AF	VA	YORKTOWN WEAPONS STATION	17	NAVY
KY	BLUE GRASS DEPOT ACTIVITY	23	ARMY	VA	ETHAN ALLEN FIRE RANGE	17	ARMY
KY	FORT CAMPBELL	163	ARMY	WA	FORT LEWIS	132	DOE
KY	FORT KNOX	171	ARMY	WA	DOE HANFORD SITE	562	DOE
LA	BARKSDALE AIR FORCE BASE	34	AF	WA	YAKIMA FIRING CENTER	409	ARMY
LA	FORT POLK	156	ARMY	WA	FORT MC COY	93	ARMY
LA	LOUISIANA AMMO PLANT	23	ARMY				
MD	ABERDEEN PROVING GROUND	124	ARMY				

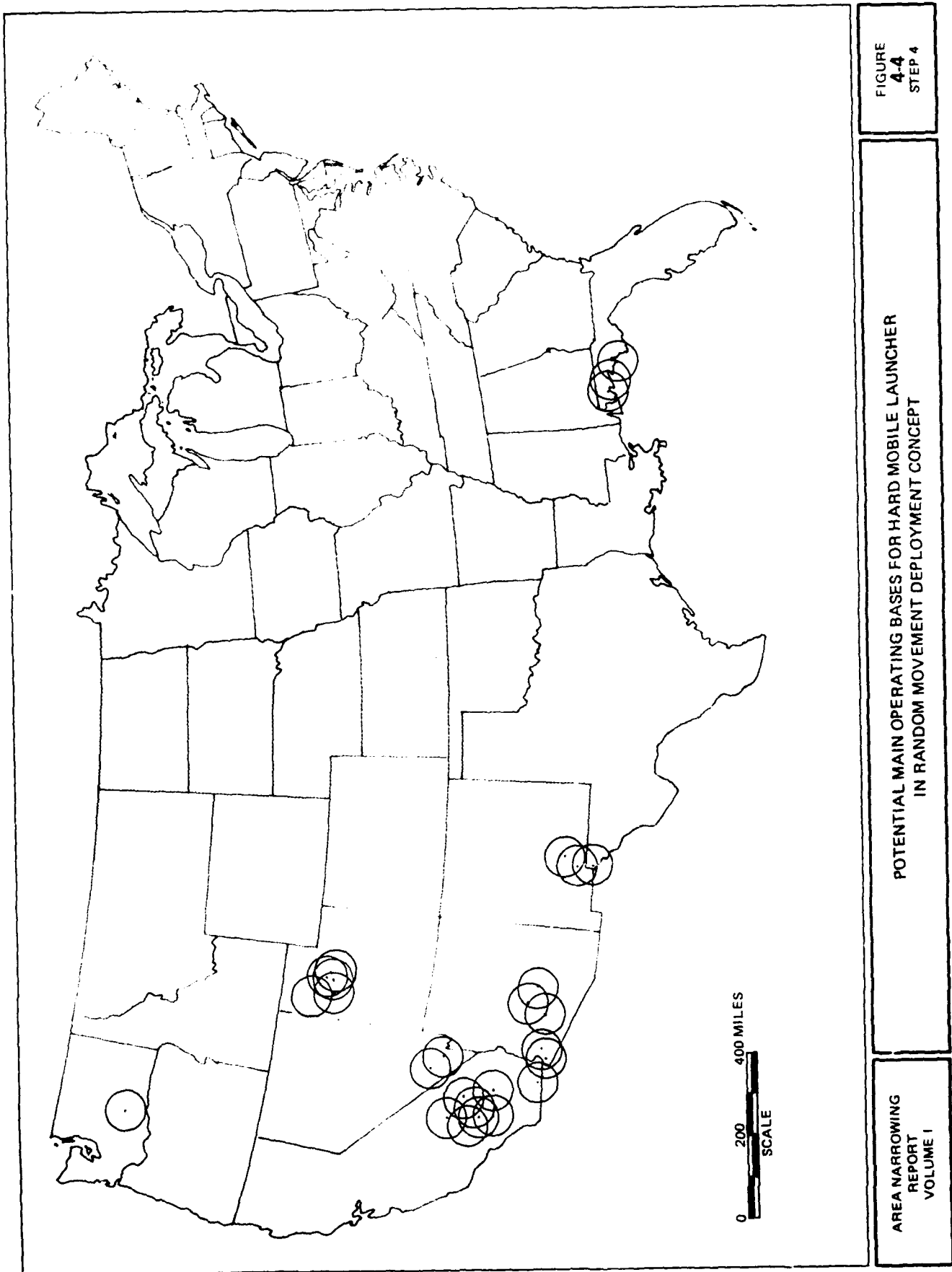


TABLE 4-3 STEP 4: POTENTIAL MAIN OPERATING BASES FOR HARD  
MOBILE LAUNCHER IN RANDOM MOVEMENT

STATE	MAIN OPERATING BASE	BASE SIZE (SQ. MI.)	OPERATING SERVICE
AZ	GILA BEND AIR FORCE AUXILIARY FIELD	3	AF
AZ	LUKE AIR FORCE BASE	7	AF
AZ	MARINE CORPS AIR STATION, YUMA	5	USMC
AZ	WILLIAMS AIR FORCE BASE	7	AF
AZ	YUMA PROVING GROUND	1310	ARMY
CA	CHINA LAKE NAVAL WEAPONS CENTER	1714	NAVY
CA	EDWARDS AIR FORCE BASE	470	AF
CA	EL CENTRO NAVAL AIR FACILITY	4	NAVY
CA	FORT IRWIN NATIONAL TRAINING CENTER	1062	ARMY
CA	GEORGE AIR FORCE BASE	8	AF
CA	MCAGCC TWENTYNINE PALMS	932	USMC
CA	MARINE CORPS LOGISTICS BASE, BARSTOW	9	USMC
CA	NORTON AIR FORCE BASE	3	AF
FL	EGLIN AIR FORCE BASE	723	AF
FL	PANAMA CITY COASTAL SYSTEMS CENTER	2	NAVY
FL	WHITING FIELD NAVAL AIR STATION	6	NAVY
NM	HOLLOMAN AIR FORCE BASE	75	AF
NM	WHITE SANDS MISSILE RANGE HQ	3046	ARMY
NV	INDIAN SPRINGS AIR FORCE AUXILIARY FIELD	4	AF
NV	NELLIS AIR FORCE BASE	18	AF
TX	FORT BLISS	1750	ARMY
UT	CAMP WILLIAMS	36	NG
UT	DUGWAY PROVING GROUND	1246	ARMY
UT	HILL AIR FORCE RANGE	573	AF
UT	TOOELE ARMY DEPOT NORTH	39	ARMY
UT	TOOELE ARMY DEPOT SOUTH	30	ARMY
WA	YAKIMA FIRING CENTER	409	ARMY

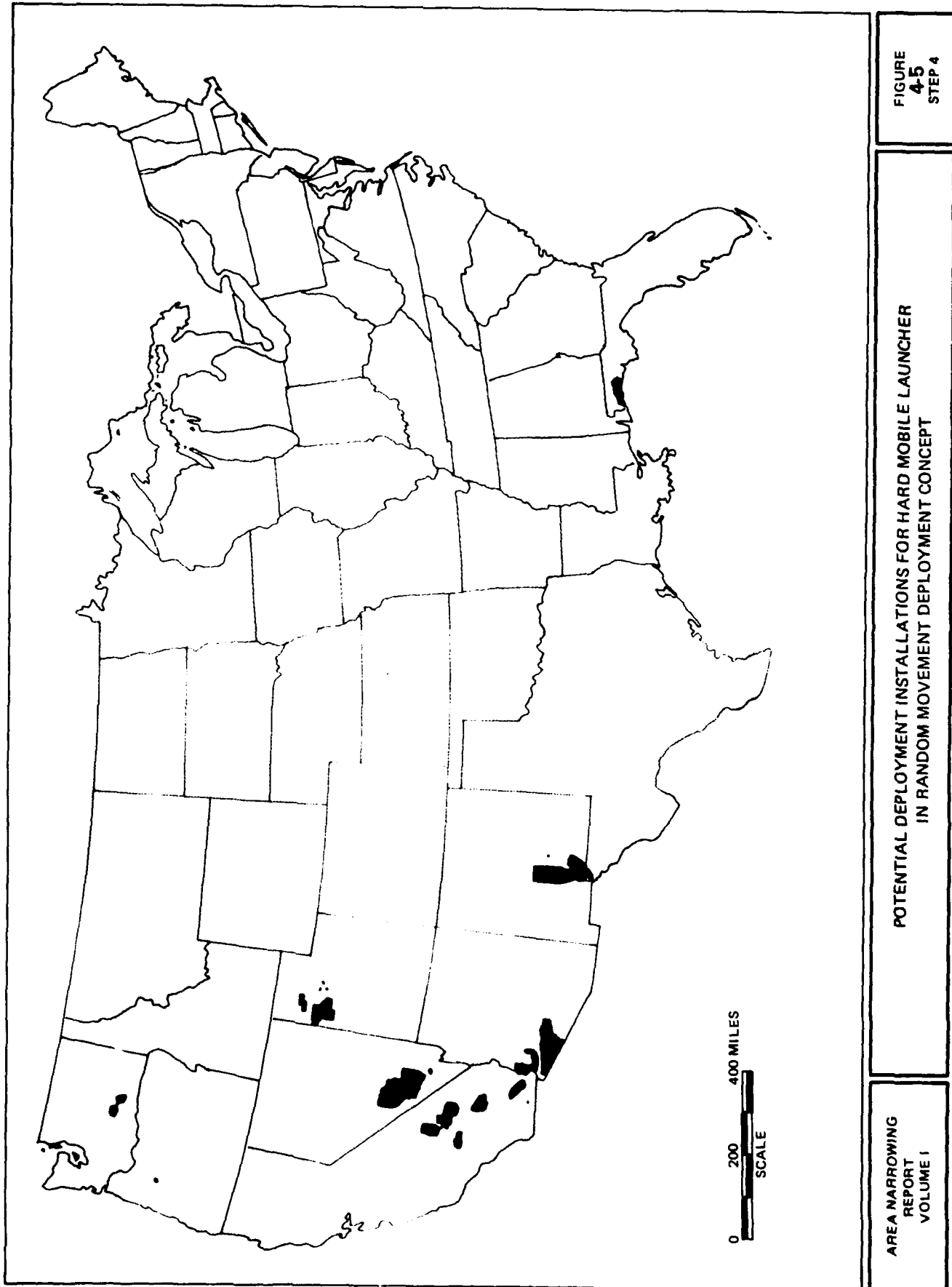


TABLE 4-4 STEP 4: POTENTIAL DEPLOYMENT INSTALLATIONS FOR HARD  
MOBILE LAUNCHER IN RANDOM MOVEMENT

STATE	DEPLOYMENT INSTALLATIONS	INSTALLATION		OPERATING SERVICE
		SIZE (SQ. MI.)		
AZ	LUKE AIR FORCE RANGE	4171		AF
AZ	YUMA PROVING GROUND	1310		ARMY
CA	CHINA LAKE NAVAL WEAPONS CENTER	1714		NAVY
CA	CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE	718		NAVY
CA	EDWARDS AIR FORCE BASE	470		AF
CA	EL CENTRO NAVAL AIR FACILITY	86		NAVY
CA	FORT IRWIN NATIONAL TRAINING CENTER	1062		ARMY
CA	MCAGCC TWENTYNINE PALMS	932		USMC
FL	EGLIN AIR FORCE BASE	723		AF
NM	HOLLOMAN AIR FORCE BASE	75		AF
NM	SACRAMENTO PEAK UARS	65		AF
NM	WHITE SANDS MISSILE RANGE	3046		ARMY
NV	NELLIS AIR FORCE BASE	18		AF
NV	NELLIS AIR FORCE RANGE	4690		AF
NV	NELLIS SMALL ARMS ANNEX	17		AF
NV	NEVADA TEST SITE	1350		DOE
TX	FORT BLISS	1750		ARMY
UT	CAMP WILLIAMS	36		NG
UT	DUGWAY PROVING GROUND	1246		ARMY
UT	HILL AIR FORCE RANGE	573		AF
UT	TOOELE ARMY DEPOT NORTH	39		ARMY
UT	TOOELE ARMY DEPOT SOUTH	30		ARMY
UT	WENDOVER AIR FORCE RANGE	922		AF
WA	DOE HANFORD SITE	562		DOE
WA	YAKIMA FIRING CENTER	409		ARMY

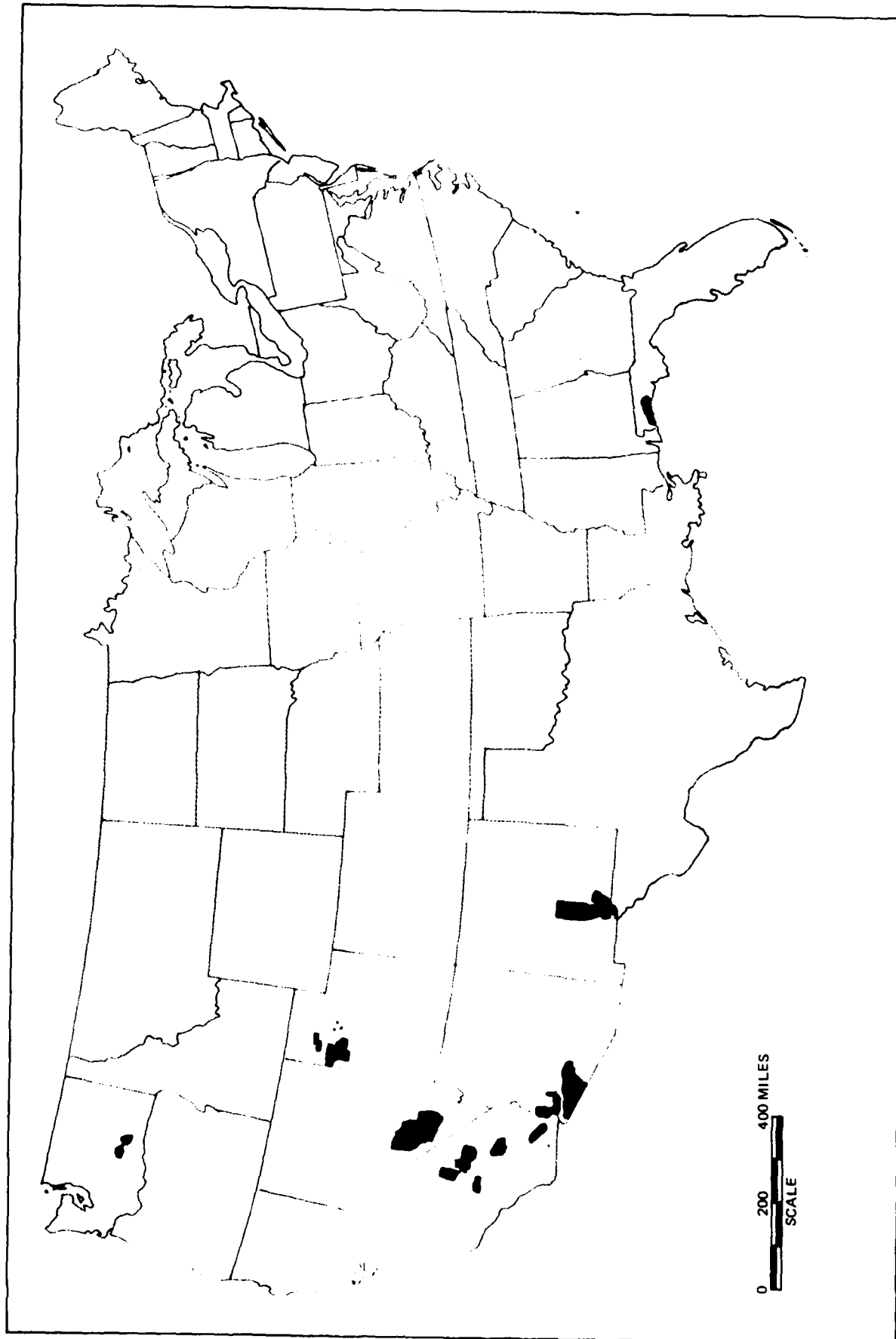


FIGURE  
6  
STEP 5

POTENTIAL DEPLOYMENT INSTALLATIONS WITH EQUAL TO OR GREATER THAN  
16 SQUARE MILES OF EFFECTIVE AREA

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TABLE 4-5 STEP 5: POTENTIAL DEPLOYMENT INSTALLATIONS WITH EQUAL TO OR GREATER THAN 16 SQUARE MILES OF EFFECTIVE AREA

STATE	INSTALLATION	EFFECTIVE AREA (SQ. MI.)	INSTALLATION SIZE (SQ. MI.)	OPERATING SERVICE
AZ	LUKE AIR FORCE RANGE	3556	4171	AF
AZ	YUMA PROVING GROUND	1153	1310	ARMY
CA	CHINA LAKE NAVAL WEAPONS CENTER	1249	1714	NAVY
CA	CHOCOLATE MOUNTAIN AGR	655	718	NAVY
CA	EDWARDS AIR FORCE BASE	460	470	AF
CA	EL CENTRO NAVAL AIR FACILITY	70	86	NAVY
CA	FORT IRWIN NTC	918	1062	ARMY
CA	MCAGCC TWENTYNINE PALMS	726	932	USMC
FL	EGLIN AIR FORCE BASE	707	723	AF
NM	HOLLOMAN AIR FORCE BASE	46	75	AF
NM	SACRAMENTO PEAK UARS	10	65	AF
NM	WHITE SANDS MISSILE RANGE	2144	3046	ARMY
NV	NELLIS AIR FORCE BASE	9	18	AF
NV	NELLIS AIR FORCE RANGE	4116	4690	AF
NV	NELLIS AIR FORCE SMALL ARMS ANNEX	15	17	AF
NV	NEVADA TEST SITE	1229	1350	DOE
TX	FORT BLISS	1342	1750	ARMY
UT	CAMP WILLIAMS	28	36	NG
UT	DUGWAY PROVING GROUND	511	1246	ARMY
UT	HILL AIR FORCE RANGE	92	573	AF
UT	TOOELE ARMY DEPOT NORTH	39	39	ARMY
UT	TOOELE ARMY DEPOT SOUTH	30	30	ARMY
UT	WENDOVER AIR FORCE RANGE	74	922	AF
WA	DOE HANFORD SITE	508	562	DOE
WA	YAKIMA FIRING CENTER	296	409	ARMY

EXCLUDED INSTALLATION

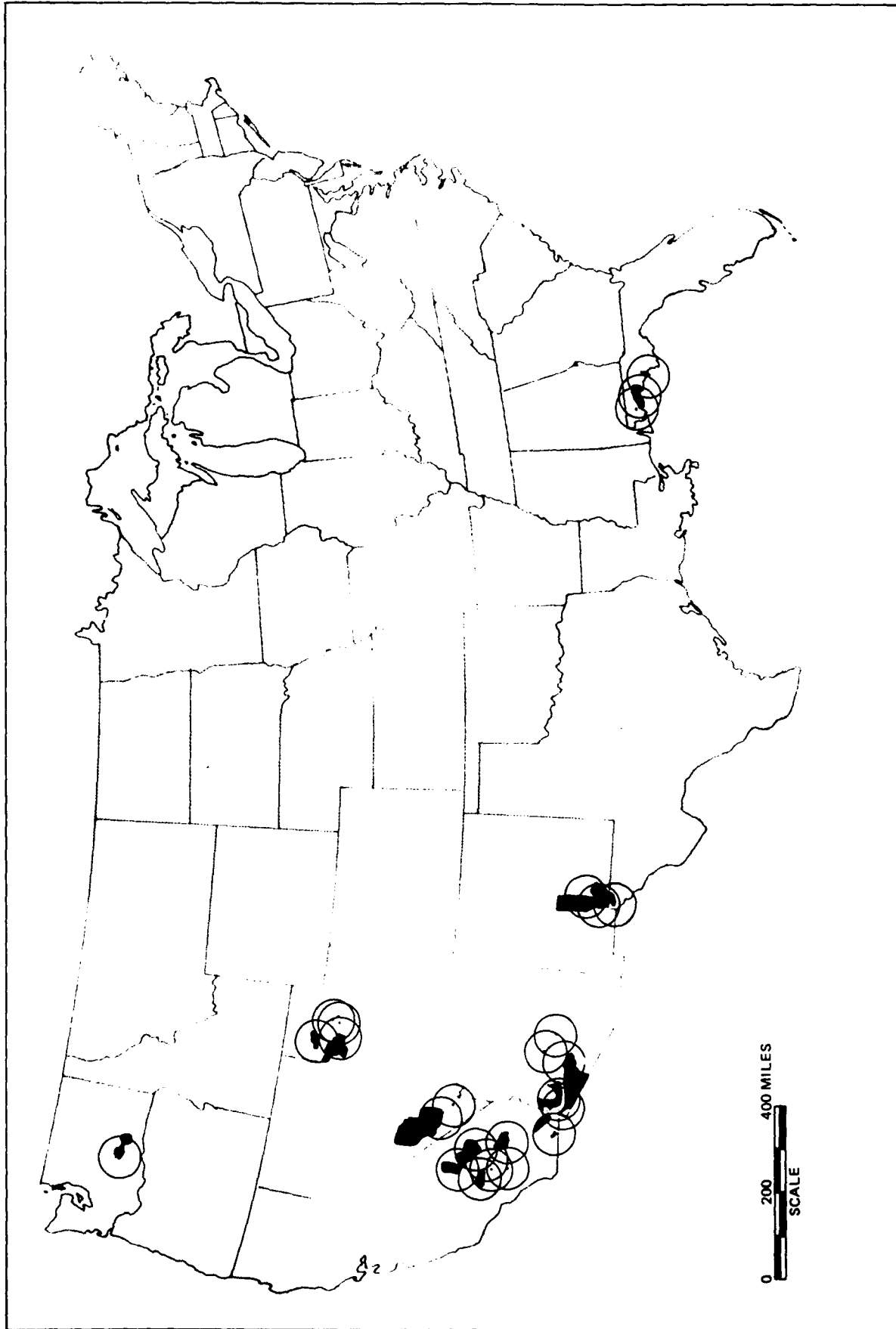


FIGURE  
4-7  
STEP 6

POTENTIAL DEPLOYMENT INSTALLATIONS AND MAIN OPERATING BASES AFTER  
EFFECTIVE AREA ANALYSIS

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TABLE 4-6 STEP 6: POTENTIAL DEPLOYMENT INSTALLATIONS AND MAIN OPERATING BASES AFTER EFFECTIVE AREA ANALYSIS

POTENTIAL DEPLOYMENT INSTALLATIONS				POTENTIAL MAIN OPERATING BASES				
STATE	INSTALLATION	EFFECTIVE AREA (SQ. MI.)	INSTALLATION SIZE (SQ. MI.)	OPERATING SERVICE	STATE	MAIN OPERATING BASE	BASE SIZE (SQ. MI.)	OPERATING SERVICE
AZ	LUKE AIR FORCE RANGE	3556	4171	AF	AZ	GILA BEND AIR FORCE AUX FIELD	3	AF
AZ	YUMA PROVING GROUND	1153	1310	ARMY	AZ	LUKE AIR FORCE BASE	7	AF
CA	CHINA LAKE NAVAL WEAPONS CENTER	1249	1714	NAVY	AZ	MARINE CORPS AIR STATION, YUMA	5	USMC
CA	CHOCOLATE MOUNTAIN AGR	655	718	NAVY	A2	WILLIAMS AIR FORCE BASE	7	AF
CA	EDWARDS AIR FORCE BASE	460	470	AF	A2	YUMA PROVING GROUND	1310	ARMY
CA	EL CENTRO NAVAL AIR FACILITY	70	86	NAVY	CA	CHINA LAKE NAVAL WEAPONS CENTER	1714	NAVY
CA	FORT IRWIN NTC	918	1062	ARMY	CA	EDWARDS AIR FORCE BASE	470	AF
CA	MCAGCC TWENTYNINE PALMS	726	932	USMC	CA	EL CENTRO NAVAL AIR FACILITY	4	NAVY
FL	EGLIN AIR FORCE BASE	707	723	AF	CA	FORT IRWIN NTC	1062	ARMY
NM	HOLLOWMAN AIR FORCE BASE	46	75	AF	CA	GEORGE AIR FORCE BASE	8	AF
NM	WHITE SANDS MISSILE RANGE	2144	3046	ARMY	CA	NORTON AIR FORCE BASE	3	AF
NV	NELLIS AIR FORCE RANGE	4116	4690	AF	CA	MCAGCC TWENTYNINE PALMS	932	USMC
NV	NEVADA TEST SITE	1229	1350	DOE	CA	MC LOGISTICS BASE, BARSTOW	9	USMC
TX	FORT BLISS	1342	1750	ARMY	FL	EGLIN AIR FORCE BASE	723	AF
UT	CAMP WILLIAMS	28	36	NG	FL	PANAMA CITY COASTAL SYSTEMS CENTER	2	NAVY
UT	DUGWAY PROVING GROUND	511	1246	ARMY	FL	WHITING FIELD NAVAL AIR STATION	6	NAVY
UT	HILL AIR FORCE RANGE	92	573	AF	NM	HOLLOWMAN AIR FORCE BASE	75	AF
UT	TOOELE ARMY DEPOT NORTH	39	39	ARMY	NM	WHITE SANDS MISSILE RANGE HQ	3046	ARMY
UT	TOOELE ARMY DEPOT SOUTH	30	30	ARMY	NV	INDIAN SPRINGS AF AUX FIELD	4	AF
UT	WENDOVER AIR FORCE RANGE	74	922	AF	NV	NELLIS AIR FORCE BASE	18	AF
WA	DOE HANFORD SITE	508	562	DOE	TX	FORT BLISS	1750	AF
WA	YAKIMA FIRING CENTER	296	409	ARMY	UT	CAMP WILLIAMS	36	NG
					UT	DUGWAY PROVING GROUND	1246	ARMY
					UT	HILL AIR FORCE RANGE	573	AF
					UT	TOOELE ARMY DEPOT NORTH	39	ARMY
					UT	TOOELE ARMY DEPOT SOUTH	30	ARMY
					WA	YAKIMA FIRING CENTER	409	ARMY

EXCLUDED INSTALLATION

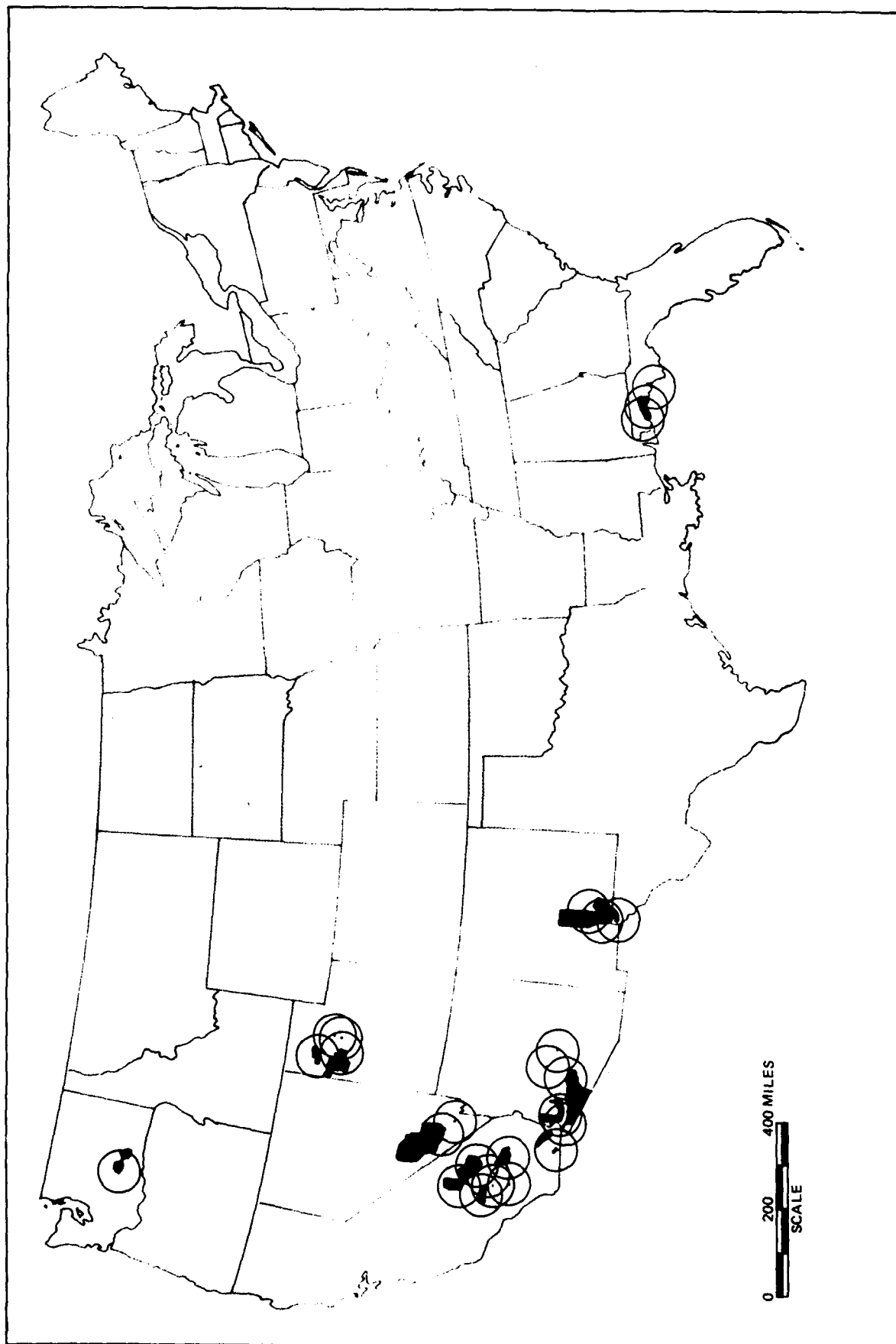


FIGURE  
4-8  
STEP 7

POTENTIAL MAIN OPERATING BASES AND DEPLOYMENT INSTALLATIONS AFTER  
APPLICATION OF MINIMUM MAIN OPERATING BASE AREA REQUIREMENTS

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TABLE 4-7 STEP 7: POTENTIAL MAIN OPERATING BASES AND DEPLOYMENT INSTALLATIONS AFTER APPLICATION OF MINIMUM MAIN OPERATING BASE AREA REQUIREMENTS

POTENTIAL DEPLOYMENT INSTALLATIONS				POTENTIAL MAIN OPERATING BASES				
STATE	INSTALLATION	EFFECTIVE AREA (SQ. MI.)	INSTALLATION SIZE (SQ. MI.)	OPERATING SERVICE	STATE	MAIN OPERATING BASE	BASE SIZE (SQ. MI.)	OPERATING SERVICE
AZ	LUKE AIR FORCE RANGE	3556	4171	AF	AZ	GILA BEND AIR FORCE AUX FIELD	3	AF
AZ	YUMA PROVING GROUND	1153	1310	ARMY	AZ	LUKE AIR FORCE BASE	7	AF
CA	CHINA LAKE NAVAL WEAPONS CENTER	1249	1714	NAVY	AZ	MARINE CORPS AIR STATION, YUMA	5	USMC
CA	CHOCOLATE MOUNTAIN AGR	655	718	NAVY	AZ	WILLIAMS AIR FORCE BASE	7	AF
CA	EDWARDS AIR FORCE BASE	460	470	AF	AZ	YUMA PROVING GROUND	1310	ARMY
CA	EL CENTRO NAVAL AIR FACILITY	70	86	NAVY	CA	CHINA LAKE NAVAL WEAPONS CENTER	1714	NAVY
CA	FORT IRWIN NTC	918	1062	ARMY	CA	EDWARDS AIR FORCE BASE	477	AF
CA	MCAGCC TWENTYNINE PALMS	726	932	USMC	CA	EL CENTRO NAVAL AIR FACILITY	4	NAVY
FL	EGLIN AIR FORCE BASE	707	723	AF	CA	FORT IRWIN NTC	1062	NAVY
NM	HOLLOMAN AIR FORCE BASE	46	75	AF	CA	GEORGE AIR FORCE BASE	8	AF
NM	WHITE SANDS MISSILE RANGE	2144	3046	ARMY	CA	MCAGCC TWENTYNINE PALMS	932	USMC
NV	NELLIS AIR FORCE RANGE	4116	4690	AF	CA	MARINE CORPS LOGISTICS BASE, BARSTOW	9	USMC
NV	NEVADA TEST SITE	1229	1350	DOE	CA	NORTON AIR FORCE BASE	3	AF
TX	FORT BLISS	1342	1750	ARMY	FL	EGLIN AIR FORCE BASE	723	AF
UT	CAMP WILLIAMS	28	36	NG	FL	PANAMA CITY COASTAL SYSTEMS CENTER	2	NAVY
UT	DUGWAY PROVING GROUND	511	1246	ARMY	FL	WHITING FIELD NAVAL AIR STATION	6	NAVY
UT	HILL AIR FORCE RANGE	92	573	AF	NM	HOLLOMAN AIR FORCE BASE	75	AF
UT	TOOELE ARMY DEPOT NORTH	39	39	ARMY	NM	WHITE SANDS MISSILE RANGE HQ	3046	ARMY
UT	TOOELE ARMY DEPOT SOUTH	30	30	ARMY	NV	INDIAN SPRINGS AF AUX FIELD	4	AF
UT	WENDOVER AIR FORCE RANGE	74	922	AF	NV	NELLIS AIR FORCE BASE	18	AF
WA	DOE HANFORD SITE	508	562	DOE	TX	FORT BLISS	1750	ARMY
WA	YAKIMA FIRING CENTER	296	409	ARMY	UT	DUGWAY PROVING GROUND	1246	ARMY
					UT	HILL AIR FORCE RANGE	573	AF
					UT	TOOELE ARMY DEPOT NORTH	39	ARMY
					UT	TOOELE ARMY DEPOT SOUTH	30	ARMY
					WA	YAKIMA FIRING CENTER	409	ARMY

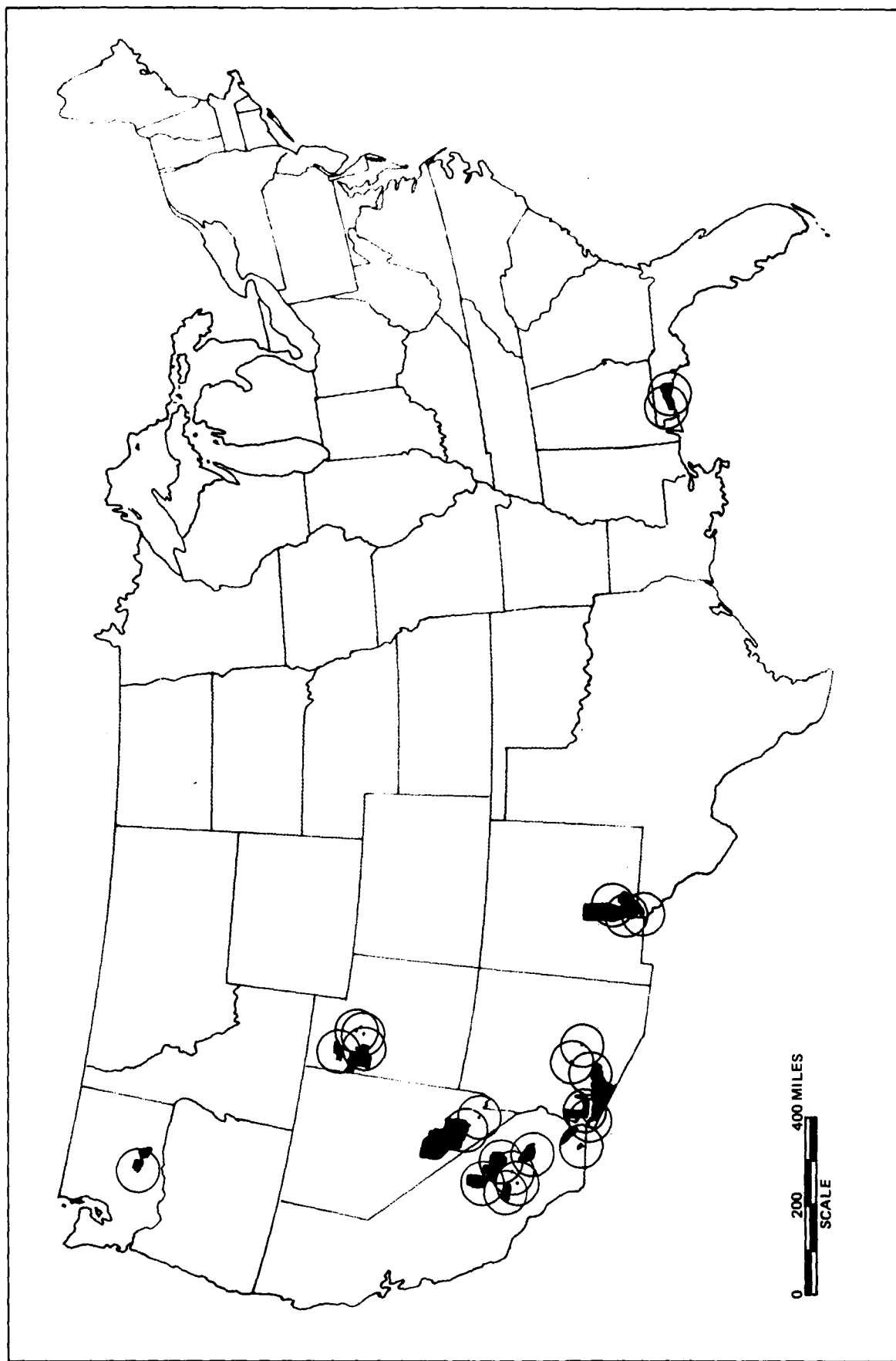


FIGURE  
**49**  
STEP 8

POTENTIAL MAIN OPERATING BASES AND DEPLOYMENT INSTALLATIONS AFTER  
APPLICATION OF ENCROACHMENT CRITERION

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TABLE 4-8 STEP 8: POTENTIAL MAIN OPERATING BASES AND DEPLOYMENT INSTALLATIONS AFTER APPLICATION OF ENCROACHMENT CRITERION

POTENTIAL DEPLOYMENT INSTALLATIONS				POTENTIAL MAIN OPERATING BASES				
STATE	INSTALLATION	EFFECTIVE AREA (SQ. MI.)	INSTALLATION SIZE (SQ. MI.)	OPERATING SERVICE	STATE	MAIN OPERATING BASE	BASE SIZE (SQ. MI.)	OPERATING SERVICE
AZ	LUKE AIR FORCE RANGE	3556	4170	AF	AZ	GILA BEND AIR FORCE AUX FIELD	3	AF
AZ	YUMA PROVING GROUND	1153	1310	ARMY	AZ	LUKE AIR FORCE BASE	7	AF
CA	CHINA LAKE NAVAL WEAPONS CENTER	1249	1714	NAVY	AZ	MARINE CORPS AIR STATION, YUMA	5	USMC
CA	CHOCOLATE MOUNTAIN AGR	655	718	NAVY	AZ	WILLIAMS AIR FORCE BASE	7	AF
CA	EDWARDS AIR FORCE BASE	460	470	AF	AZ	YUMA PROVING GROUND	1310	ARMY
CA	EL CENTRO NAVAL AIR FACILITY	70	86	NAVY	CA	CHINA LAKE NAVAL WEAPONS CENTER	1714	NAVY
CA	FORT IRWIN MTC	918	1062	ARMY	CA	EDWARDS AIR FORCE BASE	477	AF
CA	MCAGCC TWENTYNINE PALMS	726	932	USMC	CA	EL CENTRO NAVAL AIR FACILITY	86	NAVY
FL	EGLIN AIR FORCE BASE	707	723	AF	CA	FORT IRWIN	1062	ARMY
NM	HOLLOMAN AIR FORCE BASE	46	75	AF	CA	GEORGE AIR FORCE BASE	8	AF
NM	WHITE SANDS MISSILE RANGE	2144	3046	ARMY	CA	MCAGCC TWENTYNINE PALMS	932	USMC
NV	NELLIS AIR FORCE RANGE	4116	4690	AF	CA	MARINE CORPS LOGISTICS BASE, BARSTON	9	USMC
NV	NEVADA TEST SITE	1229	1350	DOE	CA	MARTIN AIR FORCE BASE	3	AF
TX	FORT BLISS	1342	1750	ARMY	FL	EGLIN AIR FORCE BASE	723	AF
UT	CAMP WILLIAMS	28	36	NG	FL	PANAMA CITY COASTAL SYSTEMS CENTER	2	NAVY
UT	DUGWAY PROVING GROUND	511	1246	ARMY	FL	WHITING FIELD NAVAL AIR STATION	6	NAVY
UT	HILL AIR FORCE RANGE	92	573	AF	NM	HOLLOMAN AFB	75	AF
UT	TOOELE ARMY DEPOT NORTH	39	39	ARMY	NM	WHITE SANDS MISSILE RANGE HQ	3046	ARMY
UT	TOOELE ARMY DEPOT SOUTH	30	30	ARMY	NV	INDIAN SPRINGS AIR FORCE AUX FIELD	4	AF
UT	WENDOVER AIR FORCE RANGE	74	922	AF	NV	NELLIS AIR FORCE BASE	18	AF
WA	DOE HANFORD SITE	508	562	DOE	TX	FORT BLISS	1750	ARMY
WA	YAKIMA FIRING CENTER	296	409	ARMY	UT	DUGWAY PROVING GROUND	1246	ARMY
					UT	HILL AIR FORCE RANGE	573	AF
					UT	TOOELE ARMY DEPOT NORTH	39	ARMY
					UT	TOOELE ARMY DEPOT SOUTH	30	ARMY
					WA	YAKIMA FIRING CENTER	409	ARMY

EXCLUDED INSTALLATION

#### 4.3 RESULTS

The potential Deployment Installations and potential Main Operating Bases that remain after application of the Exclusionary Criteria are designated as Candidate Deployment Installations and Candidate Main Operating Bases and are shown in Figure 4-10 and listed in Table 4-9. Candidate Deployment Installations that adjoin or are within approximately 50 miles of each Candidate Main Operating Base are identified in Table 4-10.



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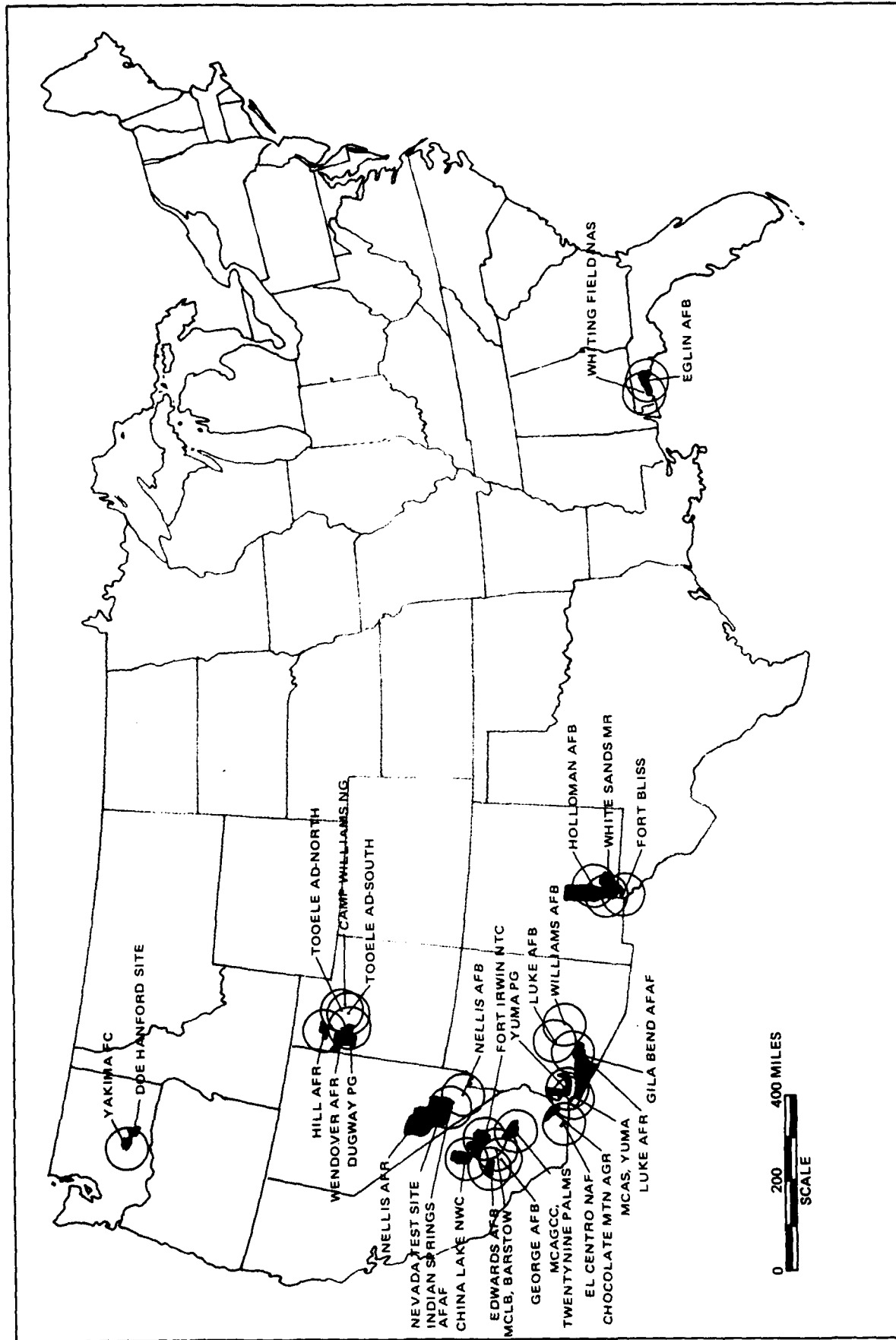


FIGURE  
4-10

CANDIDATE DEPLOYMENT INSTALLATIONS AND CANDIDATE MAIN OPERATING BASES  
AFTER APPLICATION OF EXCLUSIONARY CRITERIA

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TABLE 4-9 CANDIDATE DEPLOYMENT INSTALLATIONS AND CANDIDATE MAIN OPERATING BASES  
AFTER APPLICATION OF EXCLUSIONARY CRITERIA

CANDIDATE DEPLOYMENT INSTALLATIONS				CANDIDATE MAIN OPERATING BASES				
STATE	INSTALLATION	EFFECTIVE AREA (SQ. MI.)	INSTALLATION SIZE (SQ. MI.)	OPERATING SERVICE	STATE	MAIN OPERATING BASE	BASE SIZE (SQ. MI.)	OPERATING SERVICE
AZ	LUKE AIR FORCE RANGE	3556	4171	AF	AZ	GILA BEND AIR FORCE AUX FIELD	3	AF
AZ	YUMA PROVING GROUND	1153	1310	ARMY	AZ	LUKE AIR FORCE BASE	7	AF
CA	CHINA LAKE NAVAL WEAPONS CENTER	1249	1714	NAVY	AZ	MARINE CORPS AIR STATION, YUMA	5	USMC
CA	CHOCOLATE MOUNTAIN AGR	655	718	NAVY	AZ	WILLIAMS AIR FORCE BASE	7	AF
CA	EDWARDS AIR FORCE BASE	460	470	AF	AZ	YUMA PROVING GROUND	1310	ARMY
CA	EL CENTRO NAVAL AIR FACILITY	70	86	NAVY	CA	CHINA LAKE NAVAL WEAPONS CENTER	1714	NAVY
CA	FORT IRWIN NTC	918	1062	ARMY	CA	EDWARDS AIR FORCE BASE	477	AF
CA	MCAGCC TWENTYNINE PALMS	726	932	USMC	CA	EL CENTRO AIR FACILITY	86	NAVY
FL	EGLIN AIR FORCE BASE	707	723	AF	CA	FORT IRWIN NTC	1062	ARMY
NM	HOLLOMAN AIR FORCE BASE	46	75	AF	CA	GEORGE AIR FORCE BASE	8	AF
NM	WHITE SANDS MISSILE RANGE	2144	3046	ARMY	CA	MCAGCC TWENTYNINE PALMS	932	USMC
NV	NELLIS AIR FORCE RANGE	4116	4690	AF	CA	LOGISTICS BASE, BARSTOW	9	USMC
NV	NEVADA TEST SITE	1229	1350	DOE	FL	EGLIN AIR FORCE BASE	723	AF
TX	FORT BLISS	1342	1750	ARMY	FL	WHITING FIELD NAVAL AIR STATION	6	NAVY
UT	CAMP WILLIAMS	28	36	NG	NM	HOLLOMAN AIR FORCE BASE	75	AF
UT	DUGWAY PROVING GROUND	511	1246	ARMY	NM	WHITE SANDS MISSILE RANGE HQ	3046	ARMY
UT	HILL AIR FORCE RANGE	92	573	AF	NV	INDIAN SPRINGS AIR FORCE AUX FIELD	4	AF
UT	TOOELE ARMY DEPOT NORTH	39	39	ARMY	NV	NELLIS AIR FORCE BASE	18	AF
UT	TOOELE ARMY DEPOT SOUTH	30	30	ARMY	TX	FORT BLISS	1750	ARMY
UT	WENDOVER AIR FORCE RANGE	74	922	AF	UT	DUGWAY PROVING GROUND	1246	ARMY
WA	DOE HANFORD SITE	508	562	DOE	UT	HILL AIR FORCE RANGE	573	AF
WA	YAKIMA FIRING CENTER	296	409	ARMY	UT	TOOELE ARMY DEPOT NORTH	39	ARMY
					UT	TOOELE ARMY DEPOT SOUTH	30	ARMY
					WA	YAKIMA FIRING CENTER	409	ARMY

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CANDIDATE DEPLOYMENT INSTALLATIONS

CANDIDATE MAIN OPERATING BASES		LUKE AFB, AZ	YUMA PG, AZ	CHINA LAKE NWC, CA	CHOCOLATE MTN AGR, CA	EDWARDS AFB, CA	EL CENTRO NAF, CA	FT IRWIN NTC, CA	MCAGCC, 29 PALMS, CA	EGLIN AFB, FL	HOLLOMAN AFB, NM	WHITE SANDS MR, NM	NELLIS AFB, NV	NEVADA TEST SITE, NV	FT BLISS, TX/NM	CAMP WILLIAMS, UT	DUGWAY PG, UT	HILL AFB, UT	TOOELE AD-N, UT	TOOELE AD-S, UT	WENDOVER AFB, UT	DOE HANFORD SITE, WA	YAKIMA FC, WA	TOTAL EFFECTIVE AREA (SQ. MI.)
AZ	GILA BEND AFAP	X	X																					4709
AZ	LUKE AFB	X																						3556
AZ	MCAS, YUMA	X	X		X																			5364
AZ	WILLIAMS AFB	X																						3556
AZ	YUMA PG	X	X	X																				5364
CA	CHINA LAKE NWC			X	X	X																		2629
CA	EDWARDS AFB			X	X	X																		2629
CA	EL CENTRO NAF				X	X																		725
CA	FT IRWIN NTC			X	X	X	X	X																3355
CA	GEORGE AFB			X	X	X	X	X																3355
CA	MCAGCC, 29 PALMS								X															726
CA	MCLB, BARSTOW			X	X	X	X	X																3355
FL	EGLIN AFB									X														707
FL	WHITING FIELD NAS									X														707
NM	HOLLOMAN AFB										X	X			X									3532
NM	WHITE SANDS MR										X	X			X									3532
NV	INDIAN SPRINGS AFAP												X	X										5345
NV	NELLIS AFB												X	X										5345
TX	FT BLISS										X	X			X									3532
UT	DUGWAY PG															X	X	X	X	X	X			774
UT	HILL AFB																X	X			X			677
UT	TOOELE AD-NORTH															X	X	X	X	X	X			774
UT	TOOELE AD-SOUTH															X	X		X	X	X			682
WA	YAKIMA FC																					X	X	804

NOTE: "X" INDICATES THAT THE CANDIDATE INSTALLATION IS WITHIN ABOUT 50 MILES OF CANDIDATE MAIN OPERATING BASES AND CONTRIBUTES TO MINIMUM TOTAL EFFECTIVE AREA REQUIREMENT OF 640 SQUARE MILES FOR EACH CANDIDATE MAIN OPERATING BASE.

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CANDIDATE DEPLOYMENT INSTALLATIONS WITHIN ABOUT  
50 MILES OF CANDIDATE MAIN OPERATING BASES

TABLE  
4-10

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5.0 APPLICATION OF EVALUATIVE CRITERIA

Evaluative Criteria are those criteria that do not eliminate an alternative when applied individually but, in combination, may indicate performance that is better or worse than that of other areas. Each Hard Mobile Launcher Candidate Deployment Installation, Candidate Main Operating Base, and complex (as defined in Section 2.2) was evaluated for attainment of key system goals, subgoals, and objectives. Eight complexes were identified as a result of the application of Exclusionary Criteria. These Complexes, along with the Candidate Main Operating Bases within each complex and their associated Candidate Deployment Installations, are listed in Table 5-1. Entire complexes and individual Candidate Deployment Installations were evaluated for their ability to support Hard Mobile Launcher operations and for their potential compatibility with existing missions. Candidate Main Operating Bases within each of these complexes were evaluated with regard to their ability to support Candidate Deployment Installations. The degree to which the Complexes, the Candidate Deployment Installations, and the Main Operating Bases achieve these system goals was measured through the Evaluative Criteria.

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TABLE 5-1 HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
MAIN OPERATING BASES  
AND ASSOCIATED CANDIDATE DEPLOYMENT INSTALLATIONS BY COMPLEX

Page 1 of 2

MAIN OPERATING BASE

ASSOCIATED CANDIDATE DEPLOYMENT  
INSTALLATION(S)

ARIZONA COMPLEX

- |  |   |
|--|---|
| ° Gila Bend Air Force<br>Auxiliary Field | Luke Air Force Reserve, Yuma<br>Proving Ground, Chocolate |
| ° Luke Air Force Base                    | Mountain Aerial Gunnery Range                             |
| ° Marine Corps Air Station,<br>Yuma      |   |
| ° Williams Air Force Base                |   |
| ° Yuma Proving Ground                    |   |

FLORIDA COMPLEX

- |                                      |                      |
|--------------------------------------|----------------------|
| ° Eglin Air Force Base*              | Eglin Air Force Base |
| ° Whiting Field Naval Air<br>Station |                      |

NEVADA COMPLEX

- |   |   |
|---|---|
| ° Indian Springs Air Force<br>Auxiliary Field | Nellis Air Force Reserve,<br>Nevada Test Site |
| ° Nellis Air Force Base                       |   |

NEW MEXICO/TEXAS COMPLEX

- |   |   |
|---|---|
| ° Fort Bliss                                | Fort Bliss, Holloman Air Force<br>Base, White Sands Missile Range |
| ° Holloman Air Force Base                   |   |
| ° White Sands Missile Range<br>Headquarters |   |

---

\*Includes Duke Field, Eglin Main, and Hurlburt Field location options.

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TABLE 5-1 HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
MAIN OPERATING BASES  
AND ASSOCIATED CANDIDATE DEPLOYMENT INSTALLATIONS BY COMPLEX

Page 2 of 2

MAIN OPERATING BASE

ASSOCIATED CANDIDATE DEPLOYMENT  
INSTALLATION(S)

SO.-CENTRAL CALIFORNIA COMPLEX

- |  |  |
|--|--|
| ° China Lake Naval Weapons Center                            | China Lake Naval Weapons Center,<br>Fort Irwin Naval Training Center,<br>Marine Corps Air Ground Combat Center |
| ° Edwards Air Force Base                                     |  |
| ° Fort Irwin National Training Center                        |  |
| ° George Air Force Base                                      |  |
| ° Marine Corps Air Ground Combat Center,<br>Twentynine Palms |  |
| ° Marine Corps Logistics Base, Barstow                       |  |

SOUTHERN CALIFORNIA COMPLEX

- |                                |   |
|--------------------------------|---|
| ° El Centro Naval Air Facility | El Centro Naval Air Facility,<br>Chocolate Mountain Aerial<br>Gunnery Range |
|--------------------------------|---|

UTAH COMPLEX

- |                           |  |
|---------------------------|--|
| ° Dugway Proving Ground   | Dugway Proving Ground, Hill Air<br>Force Reserve, Wendover Air<br>Force Reserve, Tooele Army Depot<br>North, Tooele Army Depot South,<br>Camp Williams |
| ° Hill Air Force Range    |  |
| ° Tooele Army Depot North |  |
| ° Tooele Army Depot South |  |

WASHINGTON COMPLEX

- |                        |  |
|------------------------|--|
| ° Yakima Firing Center | Department of Energy Hanford Site,<br>Yakima Firing Center |
|------------------------|--|

## 5.1 COMPLEXES AND CANDIDATE DEPLOYMENT INSTALLATIONS

### 5.1.1 Evaluative Criteria

One of the five system goals is considered of critical importance in discriminating among Complexes and among Candidate Deployment Installations at this stage of the siting process. This goal is to optimize system operability (Goal 2). The hierarchy of the Evaluative Criteria for Candidate Deployment Installations and for Complexes for this goal is depicted in Table 5-2. Specific definitions and rationale for each criterion are in Appendix C.

The goal of optimizing system operability reflects the desire to achieve operational efficiency while minimizing disturbance to existing missions on the installation. Operational efficiency is reflected in the cost and personnel requirements to deploy and maintain the system. Existing missions on the Candidate Deployment Installations were previously established to meet national defense priorities for weapons research and development and for training to assure a required state of readiness. The Hard Mobile Launcher system should be introduced in a manner that would minimize interference with existing missions. The requirement for random access of Hard Mobile Launchers to large land areas in order to maintain location uncertainty has the potential to disturb existing missions. An installation was also evaluated by the amount of effective area it can contribute to the total Hard Mobile Launcher system requirement. Effective area for peacetime



TABLE 5-2

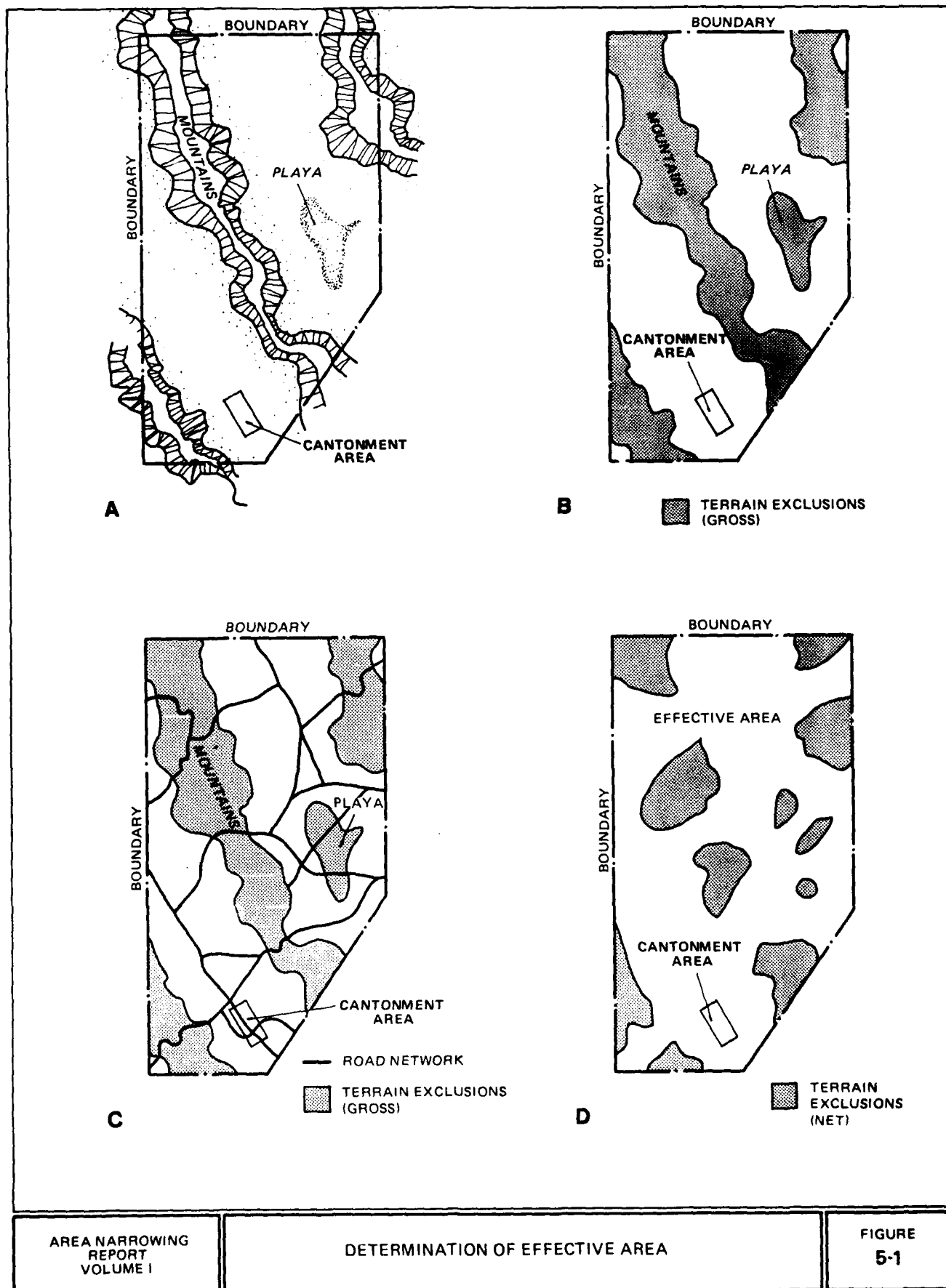
HARD MOBILE LAUNCHER IN RANDOM MOVEMENT EVALUATIVE CRITERIA  
FOR CANDIDATE DEPLOYMENT INSTALLATIONS AND COMPLEXES

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
2	2.1 OPTIMIZE DEPLOYMENT AREA OPERATIONS	2.1.3 MAXIMIZE OPERATIONS EFFECTIVENESS	2.1.3.B.1 PREFER CANDIDATE DEPLOYMENT INSTALLATIONS WITH SHORTER TRAVEL DISTANCE BETWEEN SIGNIFICANT DEPLOYMENT AREAS AND THE CANDIDATE MAIN OPERATING BASE	TRAVEL TIME/DISTANCE FROM NEAREST CANDIDATE MAIN OPERATING BASE TO SIGNIFICANT DEPLOYMENT AREAS ON THE CANDIDATE DEPLOYMENT INSTALLATION
			2.1.3.B.2 PREFER COMPLEXES WITH SHORTER TRAVEL DISTANCES BETWEEN SIGNIFICANT DEPLOYMENT AREAS ON CANDIDATE DEPLOYMENT INSTALLATION AND CANDIDATE MAIN OPERATING BASES	TRAVEL TIME/DISTANCE FROM MOST CENTRALLY LOCATED CANDIDATE MAIN OPERATING BASE TO SIGNIFICANT DEPLOYMENT AREAS ON CANDIDATE DEPLOYMENT INSTALLATIONS IN THE COMPLEX
			2.4 MAXIMIZE MISSION COMPATIBILITY	AREA OF MISSION COMPATIBILITY
	2.4.1 MINIMIZE MISSION CONFLICTS	2.4.1.1 MINIMIZE MISSION CONFLICTS	2.4.1.B.1 PREFER CANDIDATE DEPLOYMENT INSTALLATIONS WITH LARGER MISSION COMPATIBLE AREAS FOR RANDOM MOVEMENT AND COMMAND DISPERSAL	AREA OF MISSION COMPATIBILITY
			2.4.1.B.2 PREFER COMPLEXES WITH LARGER MISSION COMPATIBLE AREAS ON CANDIDATE DEPLOYMENT INSTALLATIONS FOR RANDOM MOVEMENT AND COMMAND DISPERSAL	AREA OF MISSION COMPATIBILITY

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operations (random movement and command dispersal) is area that is either accessible directly to the Hard Mobile Launcher or near a road traversable by the Hard Mobile Launcher. Effective area was determined in the following way: first, inaccessible areas were calculated and subtracted from the total land areas on the installations. These included: areas of greater than 25 percent slope, blocky lava flows, sand dunes, surface water, and areas with soils of insufficient load-bearing capability. Next, policy exclusion areas were subtracted. Policy exclusion areas include National and State Parks, National and State Monuments, Wilderness Areas, National Recreation Areas, Wild and Scenic Rivers, and the Candidate Deployment Installation cantonment areas. Finally, areas adjacent to roads through otherwise inaccessible regions were added back into the total effective area (Figure 5-1). The effective area within a complex must be at least 640 square miles to support command dispersal of 40 Hard Mobile Launchers.

Within the effective area is a smaller area that will be used continually by the Hard Mobile Launchers but not to the exclusion of other missions; this is the Random Movement Area.



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The Random Movement Area is that area in which the Hard Mobile Launcher would operate on a day-to-day basis. The location uncertainty of the vehicle would be preserved by random periodic movement on roads within that area. The Random Movement Area must be located so that the Hard Mobile Launchers may reach a significant portion of the effective area on and off base during attack dispersal. Location of the Random Movement Area on the perimeter of the installation would optimize these objectives.

The areas preferred for Random Movement Area on the host installation are compatible mission areas as well as areas that are partially constrained by schedule conflicts. The use of Random Movement Areas in areas of temporary avoidance may be required, but should be minimized. The Random Movement Area shall not be located in mission areas identified as permanently incompatible.

Mission compatibility was evaluated by determining the degree to which the Hard Mobile Launcher system could be integrated into the land use at the installations without interfering with existing missions. This evaluation was based on preliminary system operations concepts and is on-going. The amount of area on the installation that would be compatible with the system mission at all times or on a scheduling basis would be considered for day-to-day random movement of the vehicle. In this evaluation, preference was

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given to those individual Candidate Deployment Installations and those Complexes with more mission compatible area for both random movement and command dispersal. In determining the availability of scheduling constrained land, the area considered was proportional to its estimated availability.

In order to evaluate the potential compatibilities and conflicts between a Candidate Deployment Installation's ongoing activities and the proposed Small ICBM operational concept, the relationship between each installation's often complex set of activities and Small ICBM operations had to be simplified. The approach taken was to analyze installation mission activities from the perspective of their constraint on Small ICBM operations. Four categories of activities were identified: (1) permanent incompatibility, (2) scheduling coordination requirements, (3) unconstrained use, and (4) classified - compatibility to be determined. These categories can also be associated with the deployment of the Hard Mobile Launcher under various conditions of readiness.

The first category, permanent incompatibility, was further divided into two subcategories. They are (1) high explosive contaminated areas and/or permanent hazard areas, and (2) cantonment areas, in recognition of the potential incompatibilities with daily administrative activities and potential traffic interference.

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The second category of scheduling coordination requirements recognizes that frequency of compatibility should be a consideration. This category was further divided into three subcategories. They are (1) temporary avoidance - nonexplosive impact area, (2) temporary avoidance - accident hazard area, and (3) scheduling constrained - reduced hazard exposure. Hard Mobile Launcher deployment within subcategories (1) and (2) should be limited to periods of increased tensions only.

The subcategory of scheduling constrained areas was divided into several categories primarily defined by the amount of time the area was scheduled for current mission use and by the degree of hazard as it potentially affects the Small ICBM. The Hard Mobile Launcher could be in these scheduling constrained areas for random movement during those periods when conflicting activities were not taking place.

The third major category is unconstrained use. It was divided into two subcategories: (1) areas with restricted airspace overflight but no ground activity constraints, and (2) areas with no constraints, ground or air. The Hard Mobile Launcher could be in areas of unconstrained use at any time for random movement, assuming no overflight restrictions.

The fourth major category is classified mission activities. Determination of the availability of these areas for Hard

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Mobile Launcher random movement and/or command dispersal is subject to further study.

The most important measure of deployment area operations was the distance and routing between a Candidate Main Operating Base and the deployment areas. Travel of the Hard Mobile Launchers to portions of the deployment areas by extremely long routes on and off the installation is inefficient. Additionally, off-installation travel would raise security and public safety concerns. Therefore, for this evaluation, preference was given to those individual Candidate Deployment Installations and those Complexes where significant deployment area is more accessible from a Candidate Main Operating Base.

5.1.2 Application

Two Evaluative Criteria were determined to be pertinent in discriminating among individual Candidate Deployment Installations and among Complexes at this level of evaluation. The first is the amount of potentially available effective area that would minimize interference with existing and projected installation activities. The second is the travel distance from significant portions of the deployment areas to the Candidate Main Operating Base.

First, the performance of each individual Candidate Deployment Installation was evaluated with regard to these criteria (2.1.3.B.1 and 2.4.1.B.1). Recommendations to

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eliminate Candidate Deployment Installations from further study were based on this evaluation. Then each Complex was evaluated against similar criteria (2.1.3.B.2 and 2.4.1.B.2) with respect to the aggregate performance of all its Candidate Deployment Installations. This evaluation resulted in recommendations to eliminate Complexes from further study.

A summary of the results of application of Evaluative Criteria to individual Candidate Deployment Installations and to Complexes is in Appendix D.

5.1.3 Results

Application of Evaluative Criteria resulted in the elimination of one Candidate Deployment Installation and two Complexes. Those Candidate Deployment Installations and Complexes that were eliminated as well as those that remain for further study are listed in Table 5-3.

5.2 CANDIDATE MAIN OPERATING BASES

5.2.1 Evaluative Criteria

Each Main Operating Base was evaluated for its attainment of several key system goals and subgoals. The degree to which the Main Operating Bases achieve these goals was measured using the Evaluative Criteria.

Of the five system goals, two were considered to be more important in discriminating among Main Operating Bases: optimize system operability (Goal 2) and minimize public



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TABLE 5-3 COMPLEXES AND CANDIDATE DEPLOYMENT  
INSTALLATIONS AFTER APPLICATION OF EVALUATIVE CRITERIA

<u>ELIMINATED FROM PLANNED FUTURE STUDIES</u>	<u>REMAINING FOR FURTHER CONSIDERATION</u>
<u>ARIZONA COMPLEX</u> <ul style="list-style-type: none"><li>◦ Chocolate Mountain Aerial Gunnery Range (a)</li></ul>	<u>ARIZONA COMPLEX</u> <ul style="list-style-type: none"><li>◦ Luke Air Force Range</li><li>◦ Yuma Proving Ground</li></ul>
<u>SOUTHERN CALIFORNIA COMPLEX (b)</u> <ul style="list-style-type: none"><li>◦ Chocolate Mountain Aerial Gunnery Range</li><li>◦ El Centro Naval Air Facility (area within boundaries of Restricted Airspaces R-2510 and R-2512)</li></ul>	<u>FLORIDA COMPLEX</u> <ul style="list-style-type: none"><li>◦ Eglin Air Force Base</li></ul>
<u>UTAH COMPLEX (b)</u> <ul style="list-style-type: none"><li>◦ Camp Williams</li><li>◦ Dugway Proving Ground</li><li>◦ Hill Air Force Range</li><li>◦ Tooele Army Depot North</li><li>◦ Tooele Army Depot South</li><li>◦ Wendover Air Force Range</li></ul>	<u>NEVADA COMPLEX</u> <ul style="list-style-type: none"><li>◦ Nellis Air Force Range</li><li>◦ Nevada Test Site</li></ul>
	<u>NEW MEXICO/TEXAS COMPLEX</u> <ul style="list-style-type: none"><li>◦ Fort Bliss</li><li>◦ Holloman Air Force Base</li><li>◦ White Sands Missile Range</li></ul>
	<u>SO.-CENTRAL CALIFORNIA COMPLEX</u> <ul style="list-style-type: none"><li>◦ China Lake Naval Weapons Center</li><li>◦ Edwards Air Force Base</li><li>◦ Fort Irwin National Training Center</li><li>◦ Marine Corps Air Ground Combat Center, Twentynine Palms</li></ul>
	<u>WASHINGTON COMPLEX</u> <ul style="list-style-type: none"><li>◦ Department of Energy Hanford Site</li><li>◦ Yakima Firing Center</li></ul>

NOTE: (a) Candidate Deployment Installation eliminated.  
(b) Complex eliminated.

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impact (Goal 4). The hierarchy of goals, subgoals, objectives, and criteria for Main Operating Bases is depicted in Table 5-4. Specific definitions and rationale for each criterion are in Appendix C.

5.2.1.1 Optimize System Operability

The effectiveness of a Main Operating Base was evaluated by its functional support capability, land availability, infrastructure support capability, and availability of existing transportation systems. The functional support capability of a Main Operating Base is improved when travel time and distance from the Main Operating Base to the deployment area are reduced. Preference was given to Main Operating Bases with larger base populations, which would reduce the number of indirect or base support personnel required for system operation. Main Operating Bases that could support a larger effective area among their associated Candidate Deployment Installations are more desirable. Preference was given to Main Operating Bases closest to support communities, which reduces the travel time required for transport of services and personnel to the base. Preference was given to Main Operating Bases that have available land for locating Initial Operational Capability facilities and other support components of the Hard Mobile Launcher system. Available land with ownership that would minimize the time of official land use change for support of

TABLE 5-4 MAIN OPERATING BASE EVALUATIVE CRITERIA

PAGE 1 of 6

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
2 OPTIMIZE SYSTEM OPERABILITY	2.3 MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.1 CONSIDER FUNCTIONAL SUPPORT CAPABILITY	2.3.1.B.1 PREFER SHORTER MAIN OPERATING BASE-DEPLOYMENT AREA DISTANCE	COST/HML
			2.3.1.B.2 PREFER LARGER MILITARY POPULATION	NUMBER OF PERMANENT MILITARY PERSONNEL
			2.3.1.B.3 PREFER MAIN OPERATING BASES THAT SUPPORT LARGER EFFECTIVE AREA FOR HARD MOBILE LAUNCHERS	AMOUNT OF EFFECTIVE AREA ON INSTALLATIONS WITHIN 50 MILES
			2.3.1.B.5 PREFER MAIN OPERATING BASES WITH INCREASE IN SUPPORT CAPABILITY DUE TO MISSION CHANGES	NUMBER, MAGNITUDE, AND STATUS OF MISSION CHANGE
			2.3.1.B.6 PREFER MAIN OPERATING BASES THAT ARE EASILY ACCESSIBLE FROM THE SUPPORT COMMUNITY	ROAD MILES FROM MAIN OPERATING BASE TO SUPPORT COMMUNITY
			2.3.2.B.1 PREFER MAIN OPERATING BASES WITH ADEQUATE LAND TO ACCOMMODATE THE SMALL ICBM MISSION	ACRES OF AVAILABLE LAND, FUNCTIONAL COMPATIBILITY
		2.3.2 CONSIDER LAND AVAILABILITY		

TABLE 5-4 MAIN OPERATING BASE EVALUATIVE CRITERIA

PAGE 2 of 6

<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
2 (cont'd) OPTIMIZE SYSTEM OPERABILITY	2.3 (cont'd) MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.2 (cont'd) CONSIDER LAND AVAILABILITY	2.3.2.B.2 PREFER MAIN OPERATING BASES REQUIRING MINIMUM LAND USE CHANGE TIME	AMOUNT OF FAVORABLE LAND OWNERSHIP
		2.3.3 CONSIDER INFRA- STRUCTURE SUPPORT CAPABILITY	2.3.3.B.1 PREFER MAIN OPERATING BASES WHERE WATER CAN BE EASILY OBTAINED	QUANTITY AND USE (ACRE-FEET/YEAR), QUALITY AND REGULATORY PROCESS AFFECTING WATER RESOURCES
			2.3.3.B.2 PREFER MAIN OPERATING BASES WHERE ELECTRICAL POWER TO MEET PROJECT REQUIREMENTS CAN EASILY BE OBTAINED	CAPACITY, SOURCE, AND EXPANDABILITY OF POWER SYSTEM
			2.3.3.B.3 PREFER MAIN OPERATING BASES WHERE ENERGY (HEATING) TO MEET PROJECT REQUIREMENTS CAN EASILY BE OBTAINED	CAPACITY, SOURCE, AND EXPANDABILITY OF HEATING SYSTEM
			2.3.3.B.4 PREFER MAIN OPERATING BASES WHERE WASTE-WATER TREATMENT CAPACITY IS MORE THAN ADEQUATE	CAPACITY AND EXPANDABILITY OF WASTE-WATER TREATMENT SYSTEM

TABLE 5-4 MAIN OPERATING BASE EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
2 (cont'd) OPTIMIZE SYSTEM OPERABILITY	2.3 (cont'd) MAXIMIZE MAIN OPERATING BASE EFFECTIVENESS	2.3.3 (cont'd) CONSIDER INFRA- STRUCTURE SUPPORT CAPABILITY	2.3.3.B.5 PREFER MAIN OPERATING BASES WHERE SOLID WASTE DISPOSAL SYSTEM IS MORE THAN ADEQUATE	CAPACITY, EXPANDABILITY, AND PROJECTED LIFE OF SOLID WASTE DISPOSAL SYSTEM
		2.3.4 CONSIDER TRANSPORTATION AVAILABILITY	2.3.3.B.6 PREFER MAIN OPERATING BASES WHERE STORM DRAINAGE SYSTEM IS MORE THAN ADEQUATE	CAPACITY OF STORM DRAINAGE SYSTEM
			2.3.4.B.1 PREFER MAIN OPERATING BASES WITH CAPABLE AIRFIELD ACCESSIBILITY	RUNWAY LENGTH, INSTRUMENTATION, AND PROXIMITY TO BASE
			2.3.4.B.2 PREFER MAIN OPERATING BASES WITH ADEQUATE HIGHWAY ACCESS	ROAD TYPE AND DISTANCE TO MAJOR HIGHWAY, TRAFFIC CONGESTION CONSIDERATIONS
			2.3.4.B.3 PREFER MAIN OPERATING BASES WITH RAILROAD FREIGHT SERVICE	DISTANCE OF RAIL SERVICE FROM MAIN OPERATING BASE

TABLE 5-4 MAIN OPERATING BASE EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
2 (cont'd) OPTIMIZE SYSTEM OPERABILITY	2.4 MAXIMIZE MISSION COMPATIBILITY	2.4.2 MAXIMIZE INTEGRATION POTENTIAL OF SMALL ICBM MISSION WITH EXISTING MISSION	2.4.2.B.1 PREFERENCE IS GIVEN TO TYPE OF BASE IN THE FOLLOWING ORDER: ICBM, SAC, AF, OTHER DOD/DOE	OPERATING COMMAND OF BASE
		2.5 MAXIMIZE QUALITY OF LIFE	2.5.1.B.1 PREFER A LARGER DEVELOPED AREA WITHIN 25 MILES OF THE MAIN OPERATING BASES	LARGEST NEARBY POPULATION CENTER
	4.1 MINIMIZE PUBLIC IMPACT	4.1.5 MINIMIZE IMPACTS ON RESOURCE AVAILABILITY	2.5.1.B.2 PREFER MAIN OPERATING BASES WITH AVAILABLE HOUSING	NUMBER AND TYPE OF AVAILABLE HOUSES ON- AND OFF-BASE
		4.2 MAXIMIZE PUBLIC SAFETY AND SECURITY SECURITY	4.1.5.B.1 PREFER AREAS WHERE SUFFICIENT WATER CAN BE APPROPRIATED OR PURCHASED/ TRANSFERRED FOR THE MAIN OPERATING BASE AND SUPPORT COMMUNITY	QUANTITY AND USE (ACRE-FEET/YEAR), QUALITY, AND REGULATORY PROCESS AFFECTING WATER RESOURCES
		4.2.3 AVOID SAFETY CONFLICTS	4.2.3.B.1 PREFER MAIN OPERATING BASES WITH MINIMUM TRAVEL THROUGH URBAN AREAS	MILES FROM MAIN OPERATING BASE BOUNDARY TO DEPLOYMENT AREA BOUNDARY

TABLE 5-4 MAIN OPERATING BASE EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
4 (cont'd) MINIMIZE PUBLIC IMPACT	4.3 MINIMIZE SOCIAL IMPACTS	4.3.1 MINIMIZE SOCIAL DISRUPTION	4.3.1.B.1 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACTS CONTAIN LARGE POPULATIONS	URBAN POPULATIONS IN ALL COUNTIES EITHER WHOLLY OR PARTIALLY WITHIN 50 MILES OF THE MAIN OPERATING BASE
			4.3.1.B.2 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT HAVE AVAILABLE LABOR	NONAGRICULTURAL EMPLOYMENT FIGURES
			4.3.1.B.3 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT HAVE A DIVERSE ECONOMIC BASE	NUMBER OF EXPORT-PRODUCING INDUSTRIES
			4.3.1.B.4 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT AFFECT POPULATION CENTERS WITH SUBGROUP POPULATIONS SIMILAR TO THOSE INDUCED BY PROJECT CONSTRUCTION/ OPERATION	SUM OF MILITARY AND CONSTRUCTION EMPLOYMENT VERSUS TOTAL EMPLOYMENT

TABLE 5-4 MAIN OPERATING BASE EVALUATIVE CRITERIA

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<u>GOAL</u>	<u>SUBGOAL</u>	<u>OBJECTIVE</u>	<u>CRITERIA</u>	<u>MEASURE</u>
4 (cont'd) MINIMIZE PUBLIC IMPACT	4.3 (cont'd) MINIMIZE SOCIAL IMPACTS	4.3.2 MINIMIZE ADVERSE IMPACTS ON PUBLIC FINANCE	4.3.2.B.3 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT EXHIBIT BROAD-BASED TAXING EFFORT	TOTAL OWN-SOURCE REVENUES VERSUS TOTAL INCOME
		4.3.3 MINIMIZE IMPACTS ON COMMUNITY SUPPORT CAPABILITY	4.3.3.B.1 PREFER MAIN OPERATING BASES WHERE AREAS OF SOCIOECONOMIC IMPACT HAVE LARGE HOUSING SUPPLIES	TOTAL OFF- INSTALLATION VACANT HOUSING UNITS



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the Hard Mobile Launcher system is more desirable. Preference was given to Main Operating Bases with suitable infrastructure, including favorable conditions for water availability and quality, electrical power and heating supply, wastewater distribution, solid waste disposal, and storm drainage capacity. The effectiveness of the Main Operating Base is improved if there are available transportation facilities. Preference was given to Main Operating Bases with available airfields, adequate highway access, and railroad service.

Evaluation of mission compatibility of the Main Operating Base was based on the existing support service infrastructure. Preference was given to Main Operating Bases with existing Air Force Strategic Air Command ICBM missions.

5.2.1.2 Minimize Public Impact

The goal of minimizing public impact was evaluated for minimizing economic impacts and social disruption and maximizing public safety/security. Economic considerations focused on evaluating water availability in the support communities for Small ICBM project personnel and their families. Preference was given to those Main Operating Bases where water resources and the water system can be developed to accommodate project needs without compromising supply to the surrounding communities.

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Social impacts were considered by evaluating the characteristics and diversity of nearby population centers. Those factors considered included community size and proximity; size, diversity, and composition of the labor pool; and diversity of a community's economy and tax base. Preference was given to Main Operating Bases where nearby communities are large, anticipate future growth, and have a diverse socioeconomic base that could more easily absorb population influx and attendant impacts that may arise as a result of system deployment.

Public safety was considered by evaluating the road networks and associated populated areas in the vicinity of the Main Operating Bases. Preference was given to Main Operating Bases that minimize the potential for travel of Hard Mobile Launchers on public highways.

#### 5.2.2 Application

The measures for all Evaluative Criteria were combined for each Main Operating Base. The ability of each Main Operating Base to achieve system goals was used to compare and formulate recommendations for candidate bases that should be eliminated from, or that remain for, further study. A summary of pertinent results from the application of the Evaluative Criteria is provided for each Candidate Main Operating Base in Appendix E. The summary focuses on the base performance against each unit of measure as well as

achievement of critical goals.

5.2.3 Results

Application of Evaluative Criteria resulted in elimination of some Candidate Main Operating Bases that did not fulfill mission goals as well as others. These bases, along with the remaining Main Operating Bases that will be the subject of further study, are listed in Table 5-5.

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TABLE 5-5 CANDIDATE MAIN OPERATING  
BASES AFTER APPLICATION OF EVALUATIVE CRITERIA

<u>ELIMINATED FROM PLANNED FUTURE STUDIES</u>	<u>REMAINING FOR FURTHER CONSIDERATION</u>
<u>ARIZONA COMPLEX</u> <ul style="list-style-type: none"><li>° Luke Air Force Base</li><li>° Williams Air Force Base</li><li>° Marine Corps Air Station, Yuma</li></ul>	<u>ARIZONA COMPLEX</u> <ul style="list-style-type: none"><li>° Gila Bend Air Force Auxiliary Field</li><li>° Yuma Proving Ground</li></ul>
<u>FLORIDA COMPLEX</u> <ul style="list-style-type: none"><li>° Whiting Field Naval Air Station</li></ul>	<u>FLORIDA COMPLEX</u> <ul style="list-style-type: none"><li>° Eglin Air Force Base*</li></ul>
<u>SO. CENTRAL CALIFORNIA COMPLEX</u> <ul style="list-style-type: none"><li>° China Lake Naval Weapons Center</li><li>° George Air Force Base</li><li>° Marine Corps Air Ground Combat Center, Twentynine Palms</li><li>° Marine Corps Logistics Base, Barstow</li></ul>	<u>NEVADA COMPLEX</u> <ul style="list-style-type: none"><li>° Indian Springs Air Force Auxiliary Field</li><li>° Nellis Air Force Base</li></ul> <u>NEW MEXICO/TEXAS COMPLEX</u> <ul style="list-style-type: none"><li>° Fort Bliss</li><li>° Holloman Air Force Base</li><li>° White Sands Missile Range Headquarters</li></ul> <u>SO. CENTRAL CALIFORNIA COMPLEX</u> <ul style="list-style-type: none"><li>° Edwards Air Force Base</li><li>° Fort Irwin National Training Center</li></ul> <u>WASHINGTON COMPLEX</u> <ul style="list-style-type: none"><li>° Yakima Firing Center</li></ul>

\* Includes Duke Field, Eglin Main, and Hurlburt Field location options.

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## 6.0 RECOMMENDATIONS

As a result of the Comprehensive Siting Analysis Process, all but six complexes have been eliminated from consideration for Hard Mobile Launcher in Random Movement deployment. The remaining complexes will be further evaluated as part of the Environmental Impact Analysis Process. The Candidate Deployment Installations and Candidate Main Operating Bases are shown in Figure 6-1 and listed in Table 6-1.

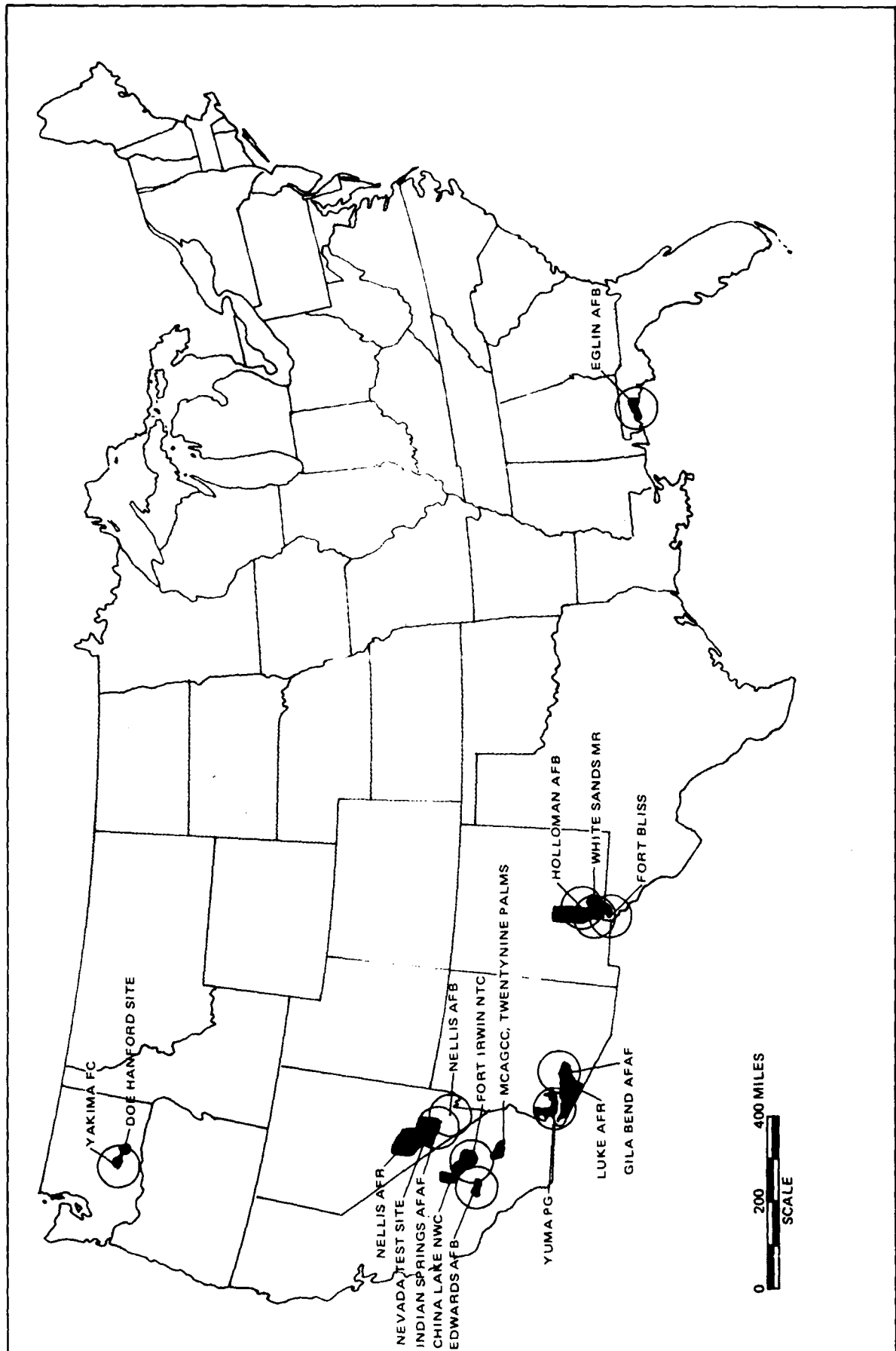


FIGURE  
6-1

CANDIDATE DEPLOYMENT INSTALLATIONS AND CANDIDATE MAIN OPERATING BASES FOLLOWING  
AREA NARROWING FOR THE HARD MOBILE LAUNCHER IN RANDOM MOVEMENT BASING MODE

AREA NARROWING  
REPORT  
VOLUME I

TABLE 6-1 REMAINING COMPLEXES

<u>CANDIDATE MAIN OPERATING BASES</u>	<u>ASSOCIATED CANDIDATE DEPLOYMENT INSTALLATION(S)</u>
<u>ARIZONA COMPLEX</u>	
◦ Gila Bend Air Force Auxiliary Field	Luke Air Force Reserve, Yuma Proving Ground
◦ Yuma Proving Ground	
<u>FLORIDA COMPLEX</u>	
◦ Elgin Air Force Base	Elgin Air Force Base
<u>NEVADA COMPLEX</u>	
◦ Indian Springs Air Force Auxiliary Field	Nellis Air Force Reserve, Nevada Test Site
◦ Nellis Air Force Base	
<u>NEW MEXICO/TEXAS COMPLEX</u>	
◦ Fort Bliss	Fort Bliss, Holloman Air Force Base, White Sands Missile Range
◦ Holloman Air Force Base	
◦ White Sands Missile Range Headquarters	
<u>SO. CENTRAL CALIFORNIA COMPLEX</u>	
◦ Edwards Air Force Base	China Lake Naval Weapons Center, Edwards Air Force Base, Fort Irwin National Training Center, Marine Corps Air Ground Combat Center Twentynine Palms
◦ Fort Irwin National Training Center	
<u>WASHINGTON COMPLEX</u>	
◦ Yakima Firing Center	Department of Energy Hanford Site, Yakima Firing Center

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APPENDIX A

MAJOR MILITARY INSTALLATIONS

SENSITIVE



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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
AL	ALABAMA ARMY AMMO PLANT	ARMY	4
AL	ANNISTON ARMY DEPOT	ARMY	4
AL	BARIN FIELD	NAVY	4
AL	CAIRNS AAF	ARMY	4
AL	COOSA RIVER STORAGE AREA	ARMY	4
AL	FORT MC CLELLEN	ARMY	4
AL	FORT RUCKER	ARMY	4
AL	GUNTER AIR FORCE STATION	AF	4
AL	MAXWELL AIR FORCE BASE	AF	4
AL	REDSTONE ARSENAL	ARMY	4
AL	SHEFFIELD PHOSPHATE DEVP WORKS	ARMY	3
AR	BLYTHEVILLE AIR FORCE BASE	AF	4
AR	FORT CHAFFEE	ARMY	4
AR	LITTLE ROCK AIR FORCE BASE	AF	4
AR	PINE BLUFF ARSENAL	ARMY	4
AZ	DAVIS-MON AIR FORCE BASE	AF	4
AZ	FLAGSTAFF STATION NAVAL OBSERVATORY	NAVY	3
AZ	FORT HUACHUCA	ARMY	4
AZ	FORT HUACHUCA, GILA BEND	ARMY	3
AZ	GILA BEND AF AUX FIELD	AF	
AZ	LUKE AIR FORCE BASE	AF	
AZ	LUKE AIR FORCE RANGE	AF	3
AZ	MARINE CORPS AIR STATION, YUMA	USMC	
AZ	NAVAJO DEPOT ACTIVITY	ARMY	4
AZ	TUCSON PLANT NO. 44	AF	3
AZ	WILLIAMS AIR FORCE BASE	AF	
AZ	YUMA PROVING GROUND	ARMY	
CA	ALAMEDA NAVAL AIR STATION	NAVY	4
CA	BEALE AIR FORCE BASE	AF	4
CA	BRIDGEPORT WEAPONS TEST CENTER	USMC	4
CA	CAMP PENDLETON MARINE CORPS BASE	USMC	4
CA	CAMP ROBERTS	NG	4

<sup>1</sup>Reference: "Detailed listing of real property owned by the United States and used by the Department of Defense military functions throughout the world as of 30 September 1983." July 1984, United States General Services Administration, Office of Administration.

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
CA	CAMP SAN LUIS OBISPO	ARMY	4
CA	CASTLE AIR FORCE BASE	AF	4
CA	CENTERVILLE BEACH FACILITY	NAVY	3
CA	CHINA LAKE NAVAL WEAPONS CENTER	NAVY	
CA	CHOCOLATE MOUNTAIN AGR	NAVY	3
CA	CONCORD WEAPONS STATION	NAVY	4
CA	CONCORD WEAPONS STA, SOLANO	NAVY	4
CA	CORONA ANNEX WEAPONS CENTER	NAVY	3
CA	CORONADO AMPHIBIOUS BASE	NAVY	3
CA	CUDDEBACK LAKE AF RANGE	AF	3
CA	EDWARDS AIR FORCE BASE	AF	
CA	EL CENTRO NAVAL AIR FACILITY	NAVY	
CA	FORT BAKER EAST	ARMY	4
CA	FORT HUNTER LIGGETT	ARMY	4
CA	FORT IRWIN NATIONAL TRAINING CENTER	ARMY	
CA	FORT MACARTHUR	ARMY	4
CA	FORT ORD	ARMY	4
CA	GEORGE AIR FORCE BASE	AF	
CA	LEMOORE NAVAL AIR STATION	NAVY	4
CA	LOMPOC DISCIPLINARY BARRACKS	ARMY	3
CA	LONG BEACH SHIPYARD	NAVY	3
CA	LOS ANGELES AIR FORCE STATION	AF	4
CA	MARCH AIR FORCE BASE	AF	4
CA	MARE ISLAND SHIPYARD	NAVY	3
CA	MARINE CORPS AIR STATION, EL TORO	USMC	4
CA	MARINE CORPS AIR STATION, TUSTIN	USMC	4
CA	MARINE CORPS LOGISTICS BASE, BARSTOW	USMC	
CA	MCAGCC, TWENTYNINE PALMS	USMC	
CA	MATHER AIR FORCE BASE	AF	4
CA	MCCLELLAN AIR FORCE BASE	AF	4
CA	MIRAMAR NAVAL AIR STATION	NAVY	4
CA	MOFFETT NAVAL AIR STATION	NAVY	4
CA	MONTEREY POSTGRADUATE SCHOOL	NAVY	4
CA	N. ISLAND NAVAL AIR STATION	NAVY	3
CA	NORTON AIR FORCE BASE	AF	
CA	OAKLAND ARMY BASE	ARMY	4
CA	OAKLAND MIL SEALIFT COM PACIFIC	NAVY	3
CA	PALMDALE PLANT NO 42 PROD FL TST IN	AF	3
CA	POINT SUR FACILITY	NAVY	4
CA	POMONA WEAPONS IND RES PLANT	NAVY	3
CA	PORT HUENEME CONST. BATTALION CTR	NAVY	4
CA	PRESIDIO OF MONTEREY	ARMY	3
CA	PRESIDIO OF SAN FRANCISCO	ARMY	3

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
CA	PT MUGU MISSILE TEST CTR	NAVY	4
CA	RIVERBANK ARMY AMMO PLANT	ARMY	4
CA	SACRAMENTO ARMY DEPOT	ARMY	4
CA	SAN BRUNO FAC ENG COM WESTERN DIV	NAVY	3
CA	SAN CLEMENTE ISLAND	NAVY	3
CA	SAN DIEGO ELEC SYS ENGINEERING CTR	NAVY	3
CA	SAN DIEGO FLEET ANTISUB WARF TRNG CT	NAVY	4
CA	SAN DIEGO FLIGHT TRAINING CTR	NAVY	4
CA	SAN DIEGO NAVAL BASE	NAVY	4
CA	SAN DIEGO RECRUIT DEPOT	USMC	3
CA	SAN FRANCISCO NAVAL BASE	NAVY	4
CA	SAN NICOLAS ISLAND FACILITY	NAVY	3
CA	SEAL BEACH WEAPONS STA	NAVY	4
CA	SHARPE ARMY DEPOT	ARMY	4
CA	SIERRA ARMY DEPOT	ARMY	4
CA	SKAGGS ISLAND SEC GROUP ACTIVITY	NAVY	3
CA	STOCKTON COMMUNICATION STATION	NAVY	3
CA	SUNNYVALE WEAPONS IND RES PLANT	NAVY	3
CA	TRAVIS AIR FORCE BASE	AF	4
CA	TREASURE ISLAND STATION	NAVY	3
CA	VANDENBERG AIR FORCE BASE	AF	4
CO	ACADEMY, AIR FORCE	AF	4
CO	BUCKLEY AIR NATIONAL GUARD FACILITY	ANG	4
CO	FITZSIMMONS ARMY MEDICAL CENTER	ARMY	3
CO	FORT CARSON	ARMY	4
CO	LOWRY AIR FORCE BASE	AF	4
CO	PETERSON AIR FORCE BASE	AF	4
CO	PINYON CANYON	ARMY	4
CO	PUEBLO DEPOT ACTIVITY	ARMY	4
CO	ROCKY MOUNTAIN ARSENAL	ARMY	4
CT	BLOOMFIELD WEAPONS IND RES PLT	NAVY	3
CT	NEW LONDON SUBMARINE BASE	NAVY	3
CT	STRATFORD ARMY ENGINE PLANT	ARMY	3
CT	WINDSOR NUCLEAR POWER TRNG UNIT	NAVY	4
DC	BOLLING AIR FORCE BASE	AF	4
DC	FORT MCNAIR	ARMY	4
DC	WASH. NAVY YARD DATA AUTOMATION COM	NAVY	3
DC	WASHINGTON AUDIOVISUAL CENTER	NAVY	4
DC	WASHINGTON MARINE BARRACKS	USMC	4
DC	WASHINGTON MILITARY SEALIFT COMMAND	NAVY	3
DC	WASHINGTON NAVAL OBSERVATORY	NAVY	3
DC	WASHINGTON RESEARCH LAB	NAVY	3
DC	WASHINGTON TELECOM COM HQ	NAVY	3

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
DE	DOVER AIR FORCE BASE	AF	4
DE	REC AREA, FIRST ARMY	ARMY	3
FL	AVON PARK AIR FORCE RANGE	AF	3
FL	CAPE CANAVERAL AF STATION	AF	4
FL	CECIL FIELD AIR STATION	NAVY	4
FL	CORRY STATION TECH TRNG CTR	NAVY	4
FL	EGLIN AF AUX FIELD NO. 9	AF	4
FL	EGLIN AIR FORCE BASE	AF	
FL	HOMESTEAD AIR FORCE BASE	AF	4
FL	HOMESTEAD SECURITY GROUP ACTIVITY	NAVY	4
FL	JACKSONVILLE FUEL DEPOT	NAVY	4
FL	JACKSONVILLE NAVAL AIR STATION	NAVY	4
FL	KEY WEST NAVAL AIR STATION	NAVY	3
FL	MACDILL AIR FORCE BASE	AF	4
FL	MAYPORT TRAINING CENTER	NAVY	4
FL	ORLANDO TRAINING CENTER	NAVY	4
FL	PANAMA CITY COASTAL SYSTEMS CENTER	NAVY	
FL	PATRICK AIR FORCE BASE	AF	4
FL	PENSACOLA EDUCATION TRNG PROG DEV CTR	NAVY	4
FL	PENSACOLA NAVAL AIR STATION	NAVY	4
FL	PINECASTLE BOMB TARGET	NAVY	3
FL	TYNDALL AIR FORCE BASE	AF	4
FL	WHITING FIELD NAVAL AIR STATION	NAVY	
GA	ATHENS SUPPLY CORPS SCHOOL	NAVY	4
GA	ATLANTA NAVAL AIR STATION	NAVY	4
GA	CATOOSA NATIONAL GUARD R R	NG	4
GA	DOBBINS AIR FORCE BASE	AF	4
GA	FORT BENNING	ARMY	4
GA	FORT GILLEM	ARMY	4
GA	FORT GORDON	ARMY	4
GA	FORT MCPHERSON	ARMY	4
GA	FORT STEWART	ARMY	4
GA	HUNTER ARMY AIRFIELD	ARMY	4
GA	KINGS BAY SUBMARINE BASE	NAVY	3
GA	MARINE CORPS LOGISTICS BASE, ALBANY	USMC	4
GA	MOODY AIR FORCE BASE	AF	4
GA	ROBINS AIR FORCE BASE	AF	4
IA	IOWA ARMY AMMO PLANT	ARMY	4
ID	DAVID TAYLOR R&D CENTER	NAVY	3
ID	IDAHO FALLS NUCLEAR POWER TRN UNIT	NAVY	3
ID	IDAHO NATL ENG. LAB	DOE	3
ID	KIMANA NATL GUARD TRNG AREA, RUPERT	NG	3
ID	LINCOLN COUNTY NATIONAL GUARD CENTER	NG	3

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
ID	MOUNTAIN HOME AF BASE	AF	4
ID	MOUNTAIN HOME AF RANGE	AF	3
ID	SAYLOR CREEK AIR FORCE RANGE	AF	3
IL	CHANUTE AIR FORCE BASE	AF	4
IL	FORT SHERIDAN	ARMY	4
IL	GLENVIEW NAVAL AIR STATION	NAVY	4
IL	GREAT LAKES NAVAL BASE	NAVY	4
IL	JOLIET ARMY AMMO PLANT ELWOOD	ARMY	4
IL	JOLIET ARMY AMMO PLANT KANAKEE	ARMY	4
IL	O'HARE INTL AIRPORT	AF	3
IL	PEORIA NAVY/MARINE CORPS RES CTR	USMC	4
IL	ROCK ISLAND ARSENAL	ARMY	4
IL	ROCK ISLAND NAVY/MC RES CTR	USMC	4
IL	SAVANNA DEPOT	ARMY	4
IL	SCOTT AIR FORCE BASE	AF	4
IL	ST LOUIS AREA SUPPORT CENTER	ARMY	4
IN	ATTERBURY RES FORCES AREA	ARMY	4
IN	CRANE WEAPONS SUP CENTER	NAVY	4
IN	FORT HARRISON	ARMY	4
IN	GRISSOM AIR FORCE BASE	AF	4
IN	INDIANA ARMY AMMO PLANT	ARMY	4
IN	INDIANAPOLIS AVIONICS CENTER	NAVY	3
IN	JEFFERSON PROVING GROUND	ARMY	4
IN	NEWPORT ARMY AMMO PLANT	ARMY	4
IN	TWIN CITIES ARMY AMMO PLANT	ARMY	4
KS	FORT LEAVENWORTH	ARMY	4
KS	FORT RILEY	ARMY	4
KS	KANSAS ARMY AMMO PLANT	ARMY	4
KS	MCCONNELL AIR FORCE BASE	AF	4
KS	SMOKY HILL ANG RANGE	ANG	3
KS	SUNFLOWER ARMY AMMO PLANT	ARMY	4
KY	BLUE GRASS DEPOT ACTIVITY	ARMY	4
KY	FORT CAMPBELL	ARMY	4
KY	FORT KNOX	ARMY	4
KY	LEXINGTON-BLUE GRASS DEPOT	ARMY	4
KY	LOUISVILLE ORDNANCE STATION	NAVY	4
LA	BARKSDALE AIR FORCE BASE	AF	4
LA	CLAIRBORNE AIR FORCE RANGE	AF	3
LA	ENGLAND AIR FORCE BASE	AF	4
LA	FORT POLK	ARMY	4
LA	LOUISIANA ARMY AMMO PLANT	ARMY	4
LA	NEW ORLEANS CHIEF OF NAVAL RESERVE	NAVY	3
LA	NEW ORLEANS NAVAL AIR STATION	NAVY	4

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
MA	BEDFORD WEAPONS IND RES PLNT	NAVY	3
MA	EVERETT PLANT NO. 28	AF	3
MA	FORT DEVENS	ARMY	4
MA	HANSCOM AIR FORCE BASE	AF	4
MA	LYNN PLANT NO. 29	AF	3
MA	MATERIALS & MECHANICS RES CTR	ARMY	3
MA	NATICK R&D CENTER	ARMY	3
MA	NORTH GRAFTON PLANT NO. 63	AF	3
MA	OTIS AIR NATIONAL GUARD FACILITY	ANG	4
MA	PITTSFIELD WEAPONS IND RES PLANT	NAVY	3
MA	SOUTH WEYMOUTH NAVAL AIR STATION	NAVY	4
MA	WATERTON ARMY MATL & MECH RES CTR	ARMY	3
MA	WESTOVER AIR FORCE BASE	AF	4
MD	ABERDEEN PROVING GROUND	ARMY	4
MD	ACADEMY, NAVAL	NAVY	4
MD	ALLEGANY BALLISTICS LABORATORY	NAVY	3
MD	ANDREWS AIR FORCE BASE	AF	4
MD	ANDREWS AIR FACILITY	NAVY	4
MD	BETHESDA CARDEROCK LAB SHIP R&D CTR	NAVY	3
MD	BLOODSWORTH ISLAND AMPHIBIOUS BASE	NAVY	3
MD	CHELTENHAM COMMUNICATION UNIT WASH.	NAVY	3
MD	EDGEWOOD ARSENAL	ARMY	4
MD	FORT DETRICK	ARMY	4
MD	FORT GEORGE G. MEADE	ARMY	4
MD	GATEWAY ARMY AMMO PLANT	ARMY	4
MD	HALETHORPE PLANT NO. 50	AF	3
MD	HARRY DIAMOND LABORATORIES	ARMY	3
MD	INDIAN HEAD ORDNANCE STATION	NAVY	4
MD	PATUXENT RIVER NATC	NAVY	4
MD	ST. INIGOES ELECT SYS ENG ACT	NAVY	3
MD	SUITLAND INTELLIGENCE SUPPORT CENTER	NAVY	4
MD	TILGHMAN ISLAND LABORATORY	NAVY	3
MD	WHITE OAK LAB SURFACE WEAPONS CENTER	NAVY	3
ME	BANGOR INTL AIRPORT	ANG	3
ME	BRUNSWICK NAVAL AIR STATION	NAVY	4
ME	EAST MACHIAS COMMUNICATION UNIT	NAVY	3
ME	LORING AIR FORCE BASE	AF	4
ME	PORTSMOUTH SHIPYARD	NAVY	3
ME	WINTER HARBOR SEC GROUP ACTIVITY	NAVY	4
MI	CUSTER RES FORCES TRAINING AREA	ARMY	4
MI	DETROIT AIR FACILITY	NAVY	4
MI	DETROIT ARSENAL	ARMY	4
MI	GRAYLING AAF	NG	4

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
MI	K.I. SAWYER AIR FORCE BASE	AF	4
MI	SELFIDGE AGB	AF	4
MI	WURTSMITH AIR FORCE BASE	AF	4
MN	DULUTH INTL AIRPORT	ANG	3
MN	FORT SNELLING RES CENTER	ARMY	4
MN	MINNEAPOLIS ORDNANCE IND RES PLANT	NAVY	3
MN	MINNEAPOLIS-ST. PAUL INTL AIRPORT	AF	3
MN	ST. PAUL IND RES PLANT	NAVY	3
MO	CAMP CLARK	NG	4
MO	FORT CROWDER	NG	4
MO	FORT LEONARD WOOD	ARMY	4
MO	KANSAS CITY FINANCE CENTER	USMC	3
MO	LAKE CITY ARMY AMMO PLANT	ARMY	4
MO	RICHARDS-GEBAUR AIR FORCE BASE	AF	4
MO	ST. LOUIS ARMY AMMO PLANT	ARMY	4
MO	ST. LOUIS AF STATION	AF	4
MO	ST. LOUIS PLANT NO. 84	AF	3
MO	WELDON SPRINGS CHEMICAL PLANT	ARMY	3
MO	WELDON SPRINGS RES FOR TRNG INSTAL	ARMY	4
MO	WHITEMAN AIR FORCE BASE	AF	4
MS	ALLEN C. THOMPSON FIELD	AF	4
MS	CAMP MCCAIN	NG	4
MS	CAMP SHELBY	NG	4
MS	COLUMBUS AIR FORCE BASE	AF	4
MS	GULFPORT CONSTRUCTION BATTALION CTR	NAVY	4
MS	KEESLER AIR FORCE BASE	AF	4
MS	MERIDAN NAVAL AIR STATION	NAVY	4
MS	MISSISSIPPI ARMY AMMO PLANT	ARMY	4
MS	OCEAN RES & DEV ACTIVITY, NSTL	NAVY	3
MS	PASCAGOULA SHIP BLDG., CONV & REP	NAVY	3
MT	FORT MISSOULA MOUNTAIN	ARMY	4
MT	FORT WILLIAM HENRY HARRISON	ARMY	4
MT	MALMSTROM AIR FORCE BASE	AF	4
NC	CAMP LEJEUNE MARINE CORPS BASE	USMC	4
NC	CAMP MACKALL	ARMY	4
NC	CAPE HATTERAS FACILITY	NAVY	4
NC	CHERRY POINT MARINE CORPS AIR STATION	USMC	4
NC	DARE COUNTY RANGE	AF	3
NC	FORT BRAGG	ARMY	4
NC	NEW RIVER NAS (HELICOPTER)	USMC	4
NC	POPE AIR FORCE BASE	AF	4
NC	SEYMOUR JOHNSON AIR FORCE BASE	AF	4
NC	SUNNY PT, MIL OCEAN TML	ARMY	4

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
NC	TARHEEL ARMY MISSILE PLANT	ARMY	3
ND	GRAND FORKS AIR FORCE BASE	AF	4
ND	MINOT AIR FORCE BASE	AF	4
NE	CAMP ASHLAND	NG	4
NE	CORNHUSKER ARMY AMMO PLANT	ARMY	4
NE	HASTINGS NATIONAL GUARD FACILITY	NG	4
NE	MEAD NATIONAL GUARD FACILITY	NG	4
NE	OFFUTT AIR FORCE BASE	AF	4
NH	ARMY COLD REGIONS LABORATORY	ARMY	3
NH	PEASE AIR FORCE BASE	AF	4
NJ	BAYONNE MIL SEALIFT COM ATLANTIC	NAVY	3
NJ	BAYONNE MILITARY OCEAN TERMINAL	ARMY	4
NJ	COLTS NECK WEAPONS STATION	NAVY	4
NJ	EARLE WEAPON STATION	NAVY	4
NJ	FORT CHARLES WOOD	ARMY	4
NJ	FORT DIX	ARMY	4
NJ	FORT MONMOUTH	ARMY	4
NJ	LAKEHURST AIR ENG CENTER	NAVY	3
NJ	MCGUIRE AIR FORCE BASE	AF	4
NJ	PICATINNY ARS HQ ARRADCOM	ARMY	3
NJ	TRENTON AIR PROPULSION TEST CENTER	NAVY	3
NJ	WARREN GROVE NG RANGE	NG	3
NM	ALBUQUERQUE PLANT NC. 83	AF	3
NM	BOELSWELLS WATER SYS. ANNEX	AF	3
NM	CANNON AIR FORCE BASE	AF	4
NM	FORT WINGATE DEPOT ACTIVITY	ARMY	4
NM	HOLLOMAN AIR FORCE BASE	AF	
HM	KIRTLAND AIR FORCE BASE	AF	4
NM	MELROSE AIR FORCE RANGE	AF	3
NM	SACRAMENTO PEAK UARS	AF	3
NM	WHITE SANDS MISSILE RANGE	ARMY	
NV	FALLON NAVAL AIR STATION	NAVY	4
NV	HAWTHORNE ARMY AMMO PLANT	ARMY	4
NV	INDIAN SPRINGS AF AUX FIELD	AF	
NV	LAKE MEAD BASE	ARMY	3
NV	NELLIS AIR FORCE BASE	AF	
NV	NELLIS AIR FORCE RANGE	AF	3
NV	NELLIS SMALL ARMS ANNEX	AF	3
NV	WENDOVER AF AUX FIELD	AF	4
NY	ACADEMY, WEST POINT	ARMY	4
NY	BALLSTON SPA NUCLEAR POWER TRNG UNIT	NAVY	4
NY	BINGHAMTON PLANT NO. 59	AF	3
NY	BROOKLYN SUPPORT ACTIVITY	NAVY	3



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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
NY	BUFFALO PLANT NO. 49	AF	3
NY	CALVERTON WEAPONS IND RES PLT	NAVY	3
NY	FORT DRUM	ARMY	4
NY	FORT HAMILTON	ARMY	4
NY	FORT TOTTEN	ARMY	4
NY	FORT WADSWORTH	ARMY	4
NY	GALEVILLE ARMY AIRPORT	ARMY	4
NY	GRIFFISS AIR FORCE BASE	AF	4
NY	GRUMAN AEROSPACE CORP	NAVY	3
NY	HANCOCK FIELD	AF	4
NY	MODEL TOWN PLANT NO. 38	AF	3
NY	NEW YORK NAVAL SUPPORT ACTIVITY	NAVY	3
NY	NEW YORK STATION	NAVY	4
NY	NIAGARA FALLS INTL AIRPORT	AF	3
NY	PLATTSBURGH AIR FORCE BASE	AF	4
NY	ROCHESTER WEAPONS IND RES PLANT	NAVY	3
NY	SENECA ARMY DEPOT	ARMY	4
NY	STEWART ANNEX	ARMY	4
NY	WATERVLIET ARSENAL	ARMY	3
OH	CAMP SHERMAN	NG	4
OH	CLEVELAND FINANCE CENTER	NAVY	3
OH	CLEVELAND PLANT NO. 47	AF	3
OH	COLUMBUS DEF CONST SUPPLY CTR	ARMY	4
OH	COLUMBUS WEAPONS IND RES PLANT	NAVY	3
OH	EVANDALE PLANT NO. 36	AF	3
OH	LIMA ARMY TANK CENTER	ARMY	3
OH	RAVENNA ARMY AMMO PLANT	ARMY	4
OH	RICKENBACKER AGR	AF	3
OH	WRIGHT PATTERSON AIR FORCE BASE	AF	4
OH	YOUNGSTOWN MUNICIPAL AIRPORT	AF	3
OK	ALTUS AIR FORCE BASE	AF	4
OK	CAMP GRUBER	NG	4
OK	FORT SILL	ARMY	4
OK	MC ALESTER ARMY AMMO PLANT	ARMY	4
OK	OKLAHOMA CITY AIR FORCE STATION	AF	4
OK	TINKER AIR FORCE BASE	AF	4
OK	TULSA PLANT NO. 3	AF	3
OK	VANCE AIR FORCE BASE	AF	4
OR	CAMP ADAIR	NG	4
OR	COOS HEAD FACILITY	NAVY	4
OR	KINGSLEY FIELD	AF	4
OR	PORTLAND NAVAL RES CENTER	NAVY	4
OR	UMATILLA DEPOT ACTIVITY	ARMY	4

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
PA	CARLISLE BARRACKS	ARMY	4
PA	FORT INDIAN TOWN GAP	ARMY	4
PA	FORT RITCHIE	ARMY	4
PA	FRANKFORT ARSENAL	ARMY	4
PA	GREATER PITTSBURG INTL AIRPORT	AF	3
PA	HAYS ARMY AMMO PLANT	ARMY	4
PA	LEHIGH VALLEY NAVAL RES CTR	NAVY	4
PA	LETTERKENNY ARMY DEPOT	ARMY	4
PA	MECHANICSBURG FLEET MAT SUP OFFICE	NAVY	4
PA	NEW CUMBERLAND ARMY DEPOT	ARMY	4
PA	PHILADELPHIA DEF PERSONNEL SUP CNTR	ARMY	4
PA	PHILADELPHIA NAVAL BASE	NAVY	4
PA	PHILADELPHIA PUB & FORMS CENTER	NAVY	3
PA	SCRANTON ARMY AMMO PLANT	ARMY	4
PA	TOBYHANNA DEPOT	ARMY	4
PA	WARMINSTER AIR DEVP CTR	NAVY	3
PA	WILLOW GROVE AF RES FACILITY	AF	4
PA	WILLOW GROVE NAVAL AIR STATION	NAVY	4
RI	NEWPORT EDUCATION & TRAINING CENTER	NAVY	3
RI	DAVISVILLE CONST. BATTALION CTR	NAVY	4
RI	FORT NATHANIEL GREEN	ARMY	4
RI	PROVIDENCE NAVAL RES CENTER	NAVY	4
RI	QUONSET POINT NAVAL AIR STATION	NAVY	4
SC	CHARLESTON AIR FORCE BASE	AF	4
SC	CHARLESTON NAVAL BASE	NAVY	4
SC	CHARLESTON WEAPON STATION	NAVY	4
SC	FORT JACKSON	ARMY	4
SC	MARINE CORPS AIR STA., BEAUFORT	USMC	4
SC	MCENTIRE AIR NATIONAL GUARD FACILITY	ANG	4
SC	MYRTLE BEACH AIR FORCE BASE	AF	4
SC	PARRIS IS. MC REC DPT	USMC	3
SC	POINSETT AIR FORCE RANGE	AF	3
SC	SHAW AIR FORCE BASE	AF	4
SD	ELLSWORTH AIR FORCE BASE	AF	4
SD	JOE FOSS FIELD	ANG	4
TN	ARNOLD AIR FORCE STATION	AF	4
TN	BRISTOL WEAPONS IND RES PLT	NAVY	3
TN	HOLSTON ARMY AMMO PLANT	ARMY	4
TN	MCGHEE TYSON AIRPORT	AF	4
TN	MEMPHIS DEFENSE DEPOT	ARMY	4
TN	MEMPHIS NAVAL AIR STATION	NAVY	4
TN	MILAN ARMY AMMO PLANT	ARMY	4
TN	VOLUNTEER ARMY AMMO PLANT	ARMY	4

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
TX	BERGSTROM AIR FORCE BASE	AF	4
TX	BROOKS AIR FORCE BASE	AF	4
TX	CAMP BULLIS	ARMY	4
TX	CAMP SWIFT	NG	4
TX	CARSWELL AIR FORCE BASE	AF	4
TX	CHASE FIELD NAVAL AIR STATION	NAVY	4
TX	CORPUS CHRISTI NAVAL AIR STATION	NAVY	4
TX	DALLAS NAVAL AIR STATION	NAVY	4
TX	DYESS AIR FORCE BASE	AF	4
TX	FORT BLISS	ARMY	
TX	FORT HOOD	ARMY	4
TX	FORT SAM HOUSTON	ARMY	4
TX	FORT WOLTERS	ARMY	4
TX	FORT WORTH PLANT NO. 4	AF	3
TX	GOODFELLOW AIR FORCE BASE	AF	4
TX	KELLY AIR FORCE BASE	AF	4
TX	KINGSVILLE NAVAL AIR STATION	NAVY	4
TX	LACKLAND AIR FORCE BASE	AF	4
TX	LAUGHLIN AIR FORCE BASE	AF	4
TX	LONE STAR ARMY AMMO PLANT	ARMY	4
TX	LONGHORN ARMY AMMO PLANT	ARMY	4
TX	MATAGORDA AIR FORCE RANGE	AF	4
TX	MCGREGOR WEAPONS IND RES	NAVY	3
TX	RANDOLPH AIR FORCE BASE	AF	4
TX	RED RIVER ARMY DEPOT	ARMY	4
TX	REESE AIR FORCE BASE	AF	4
TX	SAGINAW ARMY AIRCRAFT PLANT	ARMY	3
TX	SHEPPARD AIR FORCE BASE	AF	4
UT	CAMP WILLIAMS	NG	
UT	CORINNE PLANT NO. 78	AF	3
UT	DUGWAY PROVING GROUND	ARMY	
UT	FORT DOUGLAS	ARMY	4
UT	GREEN RIVER TEST COMPLEX	ARMY	3
UT	HERCULES POWDER-BACCHUS WORKS	NAVY	3
UT	HILL AIR FORCE BASE	AF	4
UT	HILL AIR FORCE RANGE	AF	
UT	OGDEN DEFENSE DEPOT	ARMY	4
UT	TOOELE ARMY DEPOT NORTH	ARMY	
UT	TOOELE ARMY DEPOT SOUTH AREA	ARMY	
UT	WENDOVER AIR FORCE RANGE	AF	3
VA	ALEXANDRIA FAC ENG COMMAND HQ	NAVY	3
VA	ARLINGTON CHIEF OF NAVAL MATERIAL	NAVY	3
VA	ARLINGTON CIVIL PERSONNEL COM	NAVY	3

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SENSITIVE

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TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
VA	ARLINGTON HALL STATION	ARMY	4
VA	ARLINGTON MARINE CORPS HEADQUARTERS	USMC	3
VA	CAMERON STATION	ARMY	4
VA	CAMP PEARY, EXP. TRNG ACTIVITY	NAVY	4
VA	CHEATHAM SUPPLY ANNEX	NAVY	4
VA	CHESAPEAKE SEC GROUP ACTIVITY NW	NAVY	4
VA	DAHLGREN SURFACE WEAPONS CENTER	NAVY	4
VA	DAM NECK FLEET COMB TRNG CTR ATLANTI	NAVY	4
VA	FORT BELVOIR	ARMY	4
VA	FORT EUSTIS	ARMY	4
VA	FORT HILL, AP	ARMY	4
VA	FORT LEE	ARMY	4
VA	FORT LEE AIR FORCE STATION	AF	4
VA	FORT MONROE	ARMY	4
VA	FORT MYER	ARMY	4
VA	FORT PICKETT	ARMY	4
VA	FORT STORY	ARMY	4
VA	LANGLEY AIR FORCE BASE	AF	4
VA	LITTLE CREEK AMPHIBIOUS BASE	NAVY	3
VA	MILITARY PERSONNEL COMMAND	NAVY	3
VA	NORFOLK NAVAL BASE	NAVY	4
VA	NORFOLK SHIPYARD	NAVY	3
VA	OCEANA NAVAL AIR STATION	NAVY	4
VA	QUANTICO MC DEV & ED CM	USMC	4
VA	RADFORD ARMY AMMO PLANT	ARMY	4
VA	RICHMOND DEF GENERAL SUPPLY CENTER	ARMY	4
VA	VINT HILLS FARMS STATION	ARMY	4
VA	YORKTOWN WEAPONS STATION	NAVY	4
VT	BURLINGTON INTL AIRPORT	AF	3
VT	ETHAN ALLEN FIRE RANGE	ARMY	3
VT	ETHAN ALLEN AIR NATL GUARD FACILITY	ANG	4
WA	BANGOR SUBMARINE BASE	NAVY	3
WA	BREMERTON SHIPYARD	NAVY	3
WA	CUSICK SURVIVAL TRAINING SITE	AF	3
WA	FAIRCHILD AIR FORCE BASE	AF	4
WA	FORT LEWIS	ARMY	4
WA	HUCKLEBERRY CREEK MTN TRNG INSTAL	ARMY	3
WA	JIM CREEK RADIO STATION	NAVY	3
WA	KEYPORT UNDERSEA WARFARE ENG STN	NAVY	3
WA	MCCHORD AIR FORCE BASE	AF	4
WA	PACIFIC BEACH FACILITY	NAVY	4
WA	PUGET SOUND SHIPYARD	NAVY	3
WA	SEATTLE NAVAL BASE	NAVY	4

TABLE A-1 STEPS 3 AND 4: MAJOR MILITARY INSTALLATIONS  
CONSIDERED AS POTENTIAL MAIN OPERATING BASES<sup>1</sup>

<u>STATE</u>	<u>INSTALLATION</u>	<u>OPERATING SERVICE</u>	<u>STEP IN WHICH ELIMINATED</u>
WA	WHIDBEY IS NAVAL AIR STATION	NAVY	3
WA	YAKIMA FIRING CENTER	ARMY	
WI	BADGER ARMY AMMO PLANT	ARMY	4
WI	CLAM LAKE ELEC SYS ENG CENTER	NAVY	3
WI	FORT MC COY	ARMY	4
WI	GENERAL MITCHELL FIELD	AF	4
WI	SUN PRAIRIE FAMILY HOUSING	ARMY	3
WI	TRUAX FIELD	ANG	4
WI	VOLK FIELD	ANG	4
WI	WEST SILVER SPRINGS RES COMM	ARMY	3
WV	EASTERN W. VIRGINIA REG AIRPORT	ANG	4
WV	KANAWHA COUNTY AIRPORT	ANG	4
WV	SUGAR GROVE RADIO STATION	NAVY	3
WY	CHEYENNE MUNICIPAL AIRPORT	ANG	3
WY	F.E. WARREN AIR FORCE BASE	AF	4
WY	LANDER NATIONAL GUARD FACILITY	NG	4
WY	LOVELL NATIONAL GUARD FACILITY	NG	4
WY	SHERIDAN NATIONAL GUARD FACILITY	NG	4

APPENDIX B

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT

BASING MODE

EXCLUSIONARY CRITERIA

SENSITIVE

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APPENDIX B

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
EXCLUSIONARY CRITERIA FOR AREA NARROWING

Criteria statements below are organized by goals and level of application. Full criteria descriptions, including definitions and rationale, follow and can be referenced using their alphanumeric designator.

Throughout, a distinction between "exclude" and "avoid" is maintained. "Exclude" is used in Exclusionary Criteria to indicate elimination of potential deployment areas or Main Operating Bases from further consideration. "Avoid" is used to indicate that, whenever possible, alternative areas should be selected.

The alphanumeric system is illustrated by the following example:

<u>1</u>	<u>1</u>	<u>1</u>	<u>X</u>	<u>1</u>
GOAL				
	SUBGOAL			
		OBJECTIVE		
			LEVEL OF APPLICATION	
				CRITERION

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HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
EXCLUSIONARY CRITERIA FOR AREA NARROWING

- GOAL 1: Maximize System Effectiveness
  - 1.1 Maximize System Survivability
    - 1.1.1 Optimize Preservation of Hard Mobile Launcher Uncertainty
      - Inaccessible Area (1.1.1.A.1)
      - Command Dispersal Area (1.1.1.A.2)
      - Effective Area (1.1.1.A.3)
  - 1.3 Maximize Response Capability
    - 1.3.1 Optimize Payload Effectiveness/Target Coverage
      - Temperature (1.3.1.A.1)
- GOAL 2: Optimize System Operability
  - 2.3 Maximize Main Operating Base Effectiveness
    - 2.3.1 Consider Functional Support Capability
      - Effective Area (2.3.1.A.1)
      - Operating Base Size (2.3.1.A.2)
      - Encroachment (2.3.1.A.3)
      - Existing Facilities (2.3.1.A.4)
  - 2.4 Maximize Mission Compatibility
    - 2.4.1. Minimize Mission Conflicts
      - Cantonment Activities (2.4.1.A.4)
- GOAL 4: Minimize Public Impact
  - 4.1 Minimize Economic Impacts
    - 4.1.3 Minimize Land Acquisition
      - Federal Land (4.1.3.A.1)
- GOAL 5: Minimize Environmental Impacts
  - 5.3 Minimize Impact on Special Status Lands
    - 5.3.1 Exclude Legal/Regulatory Exclusion Areas
      - Wilderness Areas (5.3.1.A.1)
      - National Monuments (5.3.1.A.2)
      - National Recreation Areas (5.3.1.A.3)
      - National Parks (5.3.1.A.4)
      - Wild/Scenic Rivers (5.3.1.A.5)



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GOAL 1: Maximize System Effectiveness

SUBGOAL 1.1: Maximize System Survivability

OBJECTIVE 1.1.1: Optimize Preservation of Hard Mobile  
Launcher Location Uncertainty

LEVEL OF APPLICATION: A - Facility Zone Exclusionary

CRITERION STATEMENT 1.1.1.A.1: Exclude vehicle inaccessible areas from consideration for operational deployment and attack dispersal of the Hard Mobile Launcher.

CRITERION DEFINITION: Vehicle inaccessible conditions are defined as equal to or greater than 25 percent slope, blocky lava flows, surface water, sand dunes, and adverse soils. Surface water includes lakes, rivers, streams (intermittent and perennial), wetland areas, and intertidal flows. Adverse soils are low to high plasticity clays and silt/clay mixtures (CL, OL, CH, OH) according to the Unified Soil Classification System.

Operational deployment areas are on base; attack dispersal areas include off-base accessible area.

CRITERION RATIONALE: Hard Mobile Launcher survivability is dependent upon its mobility to maintain position location uncertainty.

Slope of equal to or greater than 25 percent is considered to be impassable off road for the range of vehicle designs currently under consideration for the Hard Mobile Launcher. Construction of roads is considered impractical in areas with this slope.

Blocky lava flows are surficial geologic conditions of extensive lava outcrops that would preclude practical movement of any wheeled or tracked vehicle design currently under consideration for the Hard Mobile Launcher.

Sand dunes are surface soil conditions that would preclude practical movement of any vehicle design currently under consideration for the Hard Mobile Launcher.

Surface water would preclude movement of any wheeled or tracked vehicle design currently under consideration for the Hard Mobile Launcher.

Adverse soils may pose an impassable barrier to the Hard Mobile Launcher during or following rain storms or snow storms; these soils can severely reduce the amount of area available for dispersal.

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GOAL 1: Maximize System Effectiveness

SUBGOAL 1.1: Maximize System Survivability

OBJECTIVE 1.1.1: Optimize Preservation of Hard Mobile  
Launcher Location Uncertainty

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 1.1.1.A.2: Exclude installations on which the minimum command dispersal area for each Hard Mobile Launcher is less than 16 square miles of effective area.

CRITERION DEFINITION: Installations are federal lands on which public access is restricted (see Criterion 4.1.3.A.1). Command dispersal area is that area utilized for dispersal on increased alert. Suitable area for Hard Mobile Launcher deployment is defined as that area that is trafficable (Criterion 1.1.1.E.1), lies outside of legal/regulatory exclusion areas (Criteria 5.3.1.A.1, 5.3.1.A.2, 5.3.1.A.3, 5.3.1.A.4, and 5.3.1.A.5), and is not within the mission exclusion areas, including the installation cantonment area (Criterion 2.4.1.A.4). Effective area is that area that would be covered with lethal overpressures from an attack on the suitable area and existing road network, which goes through otherwise inaccessible terrain that is outside of legal/regulatory exclusion areas and cantonment areas.

CRITERION RATIONALE: During times of possible increased threat, there is a need to expand the area of operations of the Hard Mobile Launcher in order to increase its survivability. Sixteen square miles of effective area for each Hard Mobile Launcher achieves this result while causing the attacker to pay a high price.

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GOAL 1: Maximize System Effectiveness

SUBGOAL 1.1: Maximize System Survivability

OBJECTIVE 1.1.1: Optimize Preservation of Hard Mobile  
Launcher Location Uncertainty

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 1.1.1.A.3: Exclude from consideration or Hard Mobile system deployment installations that have either less than 16 square miles of effective area or their nearest boundary located significantly greater than 50 radial miles from a suitable Main Operating Base.

CRITERION DEFINITION: Installations are federal lands on which public access is restricted (Criterion 4.1.3.A.1). Suitable area is defined as that area that is trafficable (Criterion 1.1.1.A.1), lies outside of legal/regulatory exclusion areas (Criteria 5.3.1.A.1, 5.3.1.A.2, 5.3.1.A.3, 5.3.1.A.4, and 5.3.1.A.5), and is not within excluded mission areas including the installation's cantonment area (Criterion 2.4.1.A.4). Effective area is that area that would be covered with lethal overpressures from an attack on the suitable area and the existing road network that goes through otherwise inaccessible terrain that is outside of legal/regulatory exclusion areas and cantonment areas.

CRITERION RATIONALE: In order to support the desired readiness/availability rates, the Main Operating Base must be close to the deployment area to minimize travel of maintenance and security personnel to a remotely located deployment area. This is particularly significant when a large group of personnel travel frequently to a maintenance complex in the deployment area.

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GOAL 1: Maximize System Effectiveness

SUBGOAL 1.3: Maximize Response Capability

OBJECTIVE 1.3.1: Optimize Payload Effectiveness/Target Coverage

LEVEL OF APPLICATION: A - Regional Exclusionary

CRITERION STATEMENT 1.3.1.A.1: Exclude areas of the United States from consideration for Hard Mobile Launcher system deployment that have an average normal daily sol-air temperature for any month at or below 0°F.

CRITERION DEFINITION: Sol-air temperature reflects the combined effect of ambient temperature and solar radiation upon the missiles, launcher, and subsystems.

CRITERION RATIONALE: The coldest acceptable temperature below which propellant performance is unacceptably degraded is 0°F. During periods when the missile and launcher must be in an essentially dormant mode (known as the soak period) the missile will tend to stabilize at an average sol-air temperature. Assuming that the Hard Mobile Launcher will be insulated to at least R-20, the propellants will cool to about 10 percent of a change in average ambient sol-air temperature over a seven day period. Consequently, those areas with average daily temperatures measured over an entire month of 0°F or less would likely result in the degradation of the propellant performance.

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GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.1: Exclude Main Operating Bases that are significantly greater than 50 radial miles from the nearest boundaries of candidate deployment installations with a total effective area capable of deploying at least 40 Hard Mobile Launchers.

CRITERION DEFINITION: A suitable Main Operating Base satisfies criteria 2.3.1.A.3 and 4.1.3.A.2. Suitable area is defined as that area that is trafficable (Criterion 1.1.1.A.1), lies outside of the legal/regulatory exclusionary areas (Criteria 5.3.1.A.1, 5.3.1.A.2, 5.3.1.A.3, 5.3.1.A.4 and 5.3.1.A.5), and is not within excluded mission areas including the installation cantonment area. Effective area is that area that would be covered with lethal overpressures from an attack on the suitable area and the existing road network that goes through otherwise inaccessible terrain that is outside of legal/regulatory and base cantonment exclusion areas.

CRITERION RATIONALE: A minimum maintenance team size of 30 people with various skills is necessary to maintain a deployed missile, but a minimum number of deployed missiles is required to keep the team fully employed. A minimum of 40 Hard Mobile Launchers would be required to be supported by a Main Operating Base to ensure efficient use of a maintenance team.

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GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.2: Exclude from consideration all potential Main Operating Bases of less than two-thirds square mile gross area.

CRITERION DEFINITION: Gross area is a measure of total land on the installation.

CRITERION RATIONALE: The areas on a Main Operating Base required to contain the facilities to support the operational and maintenance activities of the weapon system would be a minimum of two-thirds (2/3) square miles.

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GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.3: Exclude from consideration all potential Main Operating Bases that are completely surrounded by urbanized area.

CRITERION DEFINITION: An urbanized area is defined by the Census Bureau as a central city or cities and surrounding closely settled territory comprising a minimum total population of 50,000. The closely settled surrounding territory may comprise incorporated areas with populations of 2,500 or more or other places with a density of at least 1,000 persons per square mile.

CRITERION RATIONALE: Installations that are completely surrounded by urbanized area have little or no flexibility for expansion or for adjustments in land use that may be required by the addition of a new mission.

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GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: A - Installation Exclusionary

CRITERION STATEMENT 2.3.1.A.4: Exclude inappropriate Department of Defense installations as Main Operating Bases.

CRITERION DEFINITION: Include as appropriate Department of Defense installations all land under current Department of Defense jurisdiction with existing facilities/infrastructure that may contribute to the support of a major operational mission. "Current Department of Defense jurisdiction" includes acquired land held in fee or long term lease, or presently withdrawn public domain land for any military purpose. The major operational mission support would include area for nuclear weapons handling, aerospace vehicle equipment maintenance facilities, and operational and personnel support facilities. Examples of existing Department of Defense lands that would not likely contribute to the support of a major operational mission include, but are not limited to, hospitals, finance centers, and islands.

CRITERION RATIONALE: Installations not considered are those with no infrastructure or that have a specialized use and do not provide the personnel support capabilities commonly found on Air Force, Navy, and Marine Corps bases or stations, or on Army posts or forts.



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GOAL 2: Optimize System Operability

SUBGOAL 2.4: Maximize Mission Compatibility

OBJECTIVE 2.4.1: Minimize Mission Conflicts

LEVEL OF APPLICATION: A - Facility Zone Exclusionary

CRITERION STATEMENT 2.4.1.A.4: The command dispersal area shall not occupy areas employed for installation cantonment activities.

CRITERION DEFINITION: Cantonment area includes installation operational facilities, base housing, and on-base community services and recreational facilities.

CRITERION RATIONALE: Inefficiencies inherent in joint occupation of the cantonment area could jeopardize the performance of both base and Small ICBM system missions.

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GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.3: Minimize Land Acquisition

LEVEL OF APPLICATION: A - Regional Exclusionary

CRITERION STATEMENT 4.1.3.A.1: For deployment of the Hard Mobile system consider only federal land on which public access is restricted.

CRITERION DEFINITION: Suitable federal lands are those lands not located on islands or peninsulas, or federal lands on which public access is presently restricted.

CRITERION RATIONALE: The magnitude of the area requirement is such that an unacceptable hardship would be placed on the nation, in terms of lost public and private use and cost of procurement, if it were removed from private ownership or public access.

Federal lands on islands or peninsulas would not be appropriate basing locations due to the constraints placed on the security response and maintenance operations.

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GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.1: Exclude Legal/Regulatory Exclusion Areas

LEVEL OF APPLICATION: A - Facility Zone Exclusionary

CRITERION STATEMENT 5.3.1.A.1: Exclude lands on installations within the boundaries of Wilderness Areas from consideration for operational deployment of the Hard Mobile Launcher system.

CRITERION DEFINITION: Wilderness is federally owned land "untrammeled" by man, nominated by the Secretary of the Interior and designated by Congress as a wilderness area.

CRITERION RATIONALE: For wilderness areas, statute prohibits commercial enterprise, permanent roads and, except as necessary to manage the area for wilderness purposes, temporary roads, use of motorized vehicles or other mechanical transport, and structures or installations within the area boundary. These restraints preclude siting Small ICBM in wilderness areas without specific Congressional withdrawal of the area from the National Wilderness Preservation System.

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GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.1: Exclude Legal/Regulatory Exclusion Areas

LEVEL OF APPLICATION: A - Facility Zone Exclusionary

CRITERION STATEMENT 5.3.1.A.2: Exclude land on installations within the boundaries of national and state monuments from consideration for operational deployment of the Hard Mobile Launcher system.

CRITERION DEFINITION: National monuments are historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the government of the United States that have been so designated by Presidential proclamation. State monuments have similar significance but the designation has been made by state authorities.

CRITERION RATIONALE: In order to protect such resources as national monuments, National Park Service laws require Congressional approval of certain construction activities on national monument lands. For non-Department of Defense controlled public lands, the Air Force seeks to avoid actions that would require legislative reallocation of lands set aside for a particular purpose.

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GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.1: Exclude Legal/Regulatory Exclusion Areas

LEVEL OF APPLICATION: A - Facility Zone Exclusionary

CRITERION STATEMENT 5.3.1.A.3: Exclude land on installations within the boundaries of National Recreation Areas from consideration for operational deployment of the Hard Mobile Launcher system.

CRITERION DEFINITION: National Recreation Areas are lands within the National Park System, National Forest System, or National Wildlife Refuge System that have been legislatively set aside to assure that American people of present and future generations will have adequate outdoor recreation resources. These areas are administered by the Department of Interior and are developed for various recreational activities.

CRITERION RATIONALE: Congress has declared that outdoor recreation areas are scarce resources that should be protected. Each specific area has been established by a separate piece of legislation and some have separate management regulations. For non-Department of Defense controlled public lands, the Air Force seeks to avoid actions that would require legislative reallocation of lands set aside for a particular purpose.

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GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.1: Exclude Legal/Regulatory Exclusion Areas

LEVEL OF APPLICATION: A - Facility Zone Exclusionary

CRITERION STATEMENT 5.3.1.A.4: Exclude lands on installations within the statutory boundaries of national parks and state parks from consideration for operational deployment of the Hard Mobile Launcher system.

CRITERION DEFINITION: National parks are lands set aside by Congressional action in order to be "unimpaired for the enjoyment of future generations". State parks are lands set aside by state action for similar purposes.

CRITERION RATIONALE: Among the regulations for protection of national park resources are the requirements for Congressional approval of certain construction activities within the boundaries of the parks. In order to comply with the stated purpose of the National Park Service, construction on such lands should be avoided. For non-Department of Defense controlled public lands, the Air Force seeks to avoid actions that would require legislative reallocation of lands set aside for a particular purpose.

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GOAL 5: Minimize Environmental Impacts

SUBGOAL 5.3: Minimize Impact on Special Status Lands

OBJECTIVE 5.3.1: Exclude Legal/Regulatory Exclusion Areas

LEVEL OF APPLICATION: A - Area Exclusionary

CRITERION STATEMENT 5.3.1.A.5: Exclude areas included within the wild and scenic rivers system for operational deployment of the Hard Mobile Launcher system.

CRITERION DEFINITION: Rivers potentially subject to protection under the Wild and Scenic Rivers Act are those that, "with their immediate environments possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values." The wild and scenic rivers system comprises rivers fitting the above definition that have been authorized by an act of Congress or by acts of state legislatures.

CRITERION RATIONALE: Components of the national wild and scenic rivers system must be administered so as to protect and enhance the values that caused them to be included in the system. In such administration, primary emphasis is given to protecting esthetic, scenic, historic, archeologic, and scientific features. It is unlikely that any portion of a Hard Mobile Launcher system could be constructed in the immediate environment of a wild and scenic river without substantially interfering with public use and enjoyment of those values that made the river eligible for inclusion in the system.

APPENDIX C

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT

BASING MODE

EVALUATIVE CRITERIA



APPENDIX CHARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
EVALUATIVE CRITERIA FOR AREA NARROWING

Criteria statements below are organized by goals and level of application. Full criteria descriptions, including definitions and rationale, follow and can be referenced using their alphanumeric designator.

The alphanumeric system is illustrated by the following example:

<u>1</u>	<u>1</u>	<u>1</u>	<u>X</u>	<u>1</u>
GOAL				
	SUBGOAL			
		OBJECTIVE		
			LEVEL OF APPLICATION	
				CRITERION

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
EVALUATIVE CRITERIA FOR AREA NARROWING

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- Goal 2: Optimize System Operability
- 2.1 Optimize Deployment Area Operations
    - 2.1.3 Maximize Operations Effectiveness
      - Travel Distance (2.1.3.B.1)
      - Deployment Installation Access (2.1.3.B.2)
  - 2.3 Maximize Main Operating Base Effectiveness
    - 2.3.1 Consider Functional Support Capability
      - Travel Distance (2.3.1.B.1)
      - Base Population (2.3.1.B.2)
      - Effective Area (2.3.1.B.3)
      - Mission Changes (2.3.1.B.5)
      - Distance to Support Community (2.3.1.B.6)
    - 2.3.2 Consider Land Availability
      - Adequate Land (2.3.2.B.1)
      - Ownership (2.3.2.B.2)
    - 2.3.3 Consider Infrastructure Support Capability
      - Water Obtainability (2.3.3.B.1)
      - Power (2.3.3.B.2)
      - Energy (2.3.3.B.3)
      - Waste Water (2.3.3.B.4)
      - Solid Waste (2.3.3.B.5)
      - Storm Drains (2.3.3.B.6)
    - 2.3.4 Consider Transportation Availability
      - Air (2.3.4.B.1)
      - Highway Access (2.3.4.B.2)
      - Railroad (2.3.4.B.3)
  - 2.4 Maximize Mission Compatibility
    - 2.4.1 Minimize Mission Conflicts
      - Installation Activities (2.4.1.B.1)
      - Installation Activities (2.4.1.B.2)
    - 2.4.2 Maximize Integration Potential
      - Type of Base (2.4.2.B.1)
  - 2.5 Maximize Quality of Life
    - 2.5.1 Provide Adequate Support Services
      - Support Community (2.5.1.B.1)
      - Housing Availability (2.5.1.B.2)

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT  
EVALUATIVE CRITERIA FOR AREA NARROWING  
Page 2 of 2

- Goal 4: Minimize Public Impact
- 4.1 Minimize Economic Impacts
    - 4.1.5 Minimize Impact on Resource Availability
      - Water Availability (4.1.5.B.1)
  - 4.2 Maximize Public Safety/Security
    - 4.2.3 Minimize Public Exposure to Risk
      - Public Safety (4.2.3.B.1)
  - 4.3 Minimize Social Impacts
    - 4.3.1 Minimize Social Disruption Urban Populations (4.3.1.B.1)
      - Labor Availability (4.3.1.B.2)
      - Economic Diversity (4.3.1.B.3)
      - Population Similarity (4.3.1.B.4)
    - 4.3.2 Minimize Adverse Impacts on Public Finance
      - Taxing (4.3.2.B.3)
    - 4.3.3 Minimize Impacts on Community Support Capability
      - Housing (4.3.3.B.1)

GOAL 2: Optimize System Operability

SUBGOAL 2.1: Optimize Deployment Area Operations

OBJECTIVE 2.1.3: Maximize Operations Effectiveness

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.1.3.B.1: Preference was given to Candidate Deployment Installations with shorter travel distances from significant portions of the deployment areas to the Candidate Main Operating Bases.

CRITERION DEFINITION: Significant portions of deployment areas are those available effective areas without which the installation would have either insufficient or only marginally sufficient area for Hard Mobile Launcher deployment.

CRITERION RATIONALE: Off-installation travel would require larger security forces and could possibly reduce asset availability. Longer travel times and distances would increase vehicle fuel and maintenance costs, and the percentage of the time required for personnel travel.

GOAL 2: Optimize System Operability

SUBGOAL 2.1: Optimize Deployment Area Operations

OBJECTIVE 2.1.3: Maximize Operations Effectiveness

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.1.3.B.2: Preference was given to complexes that have Candidate Deployment Installations with shorter travel distances from significant portions of their deployment areas to the Candidate Main Operating Base.

CRITERION DEFINITION: Significant portions of deployment areas are those available effective areas without which the installation would have either insufficient or only marginally sufficient area for Hard Mobile Launcher deployment.

CRITERION RATIONALE: Off-installation travel would require larger security forces and could possibly reduce asset availability. Longer travel times and distances would increase vehicle fuel and maintenance costs, and the percentage of the time required for personnel travel.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.1: Preference was given to Main Operating Bases contiguous to or within reasonably short distances of the deployment area.

CRITERION DEFINITION: Distance from the centroid of the Main Operating Base is measured in road miles to the centroid of the Candidate Deployment Installation.

CRITERION RATIONALE: Travel distance between the Main Operating Base and the Candidate Deployment Installation within 50 miles is a measure of the cost required to upgrade the existing road network to meet system requirements. In addition, greater distances increase the time and costs of deployment area operations.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.2: Preference was given to suitable Main Operating Bases with larger populations.

CRITERION DEFINITION: Base population is the number of assigned military personnel at a potential existing Main Operating Base.

CRITERION RATIONALE: Base population is used as an indicator of the capability of the base to accommodate the Hard Mobile Launcher system mission. The larger the base population, the greater the probability that a lower number of indirect or base support people would be required. Also, a larger base population would be an indicator of a full complement of housing, morale, welfare, recreation, health, and education services, as well as a full range of administrative and base support facilities.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.3: Preference was given to Main Operating Bases that support a larger total effective area on installations within approximately 50 miles.

CRITERION DEFINITION: Effective area is that area that would be covered with lethal overpressures from an attack on the suitable area and the existing road network, which goes through otherwise inaccessible terrain that is outside of legal/regulatory exclusion areas and cantonment areas.

CRITERION RATIONALE: A larger total effective area indicates a capability for deploying a larger number of Hard Mobile Launchers, resulting in greater efficiency with respect to maintenance, physical security, and operations.



GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.5: Preference was given to Main Operating Bases with recent or anticipated mission changes that increase a Main Operating Base's support capability.

CRITERION DEFINITION: Main Operating Base mission changes are changes in personnel and/or facilities that are associated with a major mission.

CRITERION RATIONALE: A base that has recently lost or expects to lose a major mission may have excess facilities space and/or support capacity. Also, replacing a lost mission with a new one can reduce impacts in local communities. Conversely, a base that is already experiencing growth may be at or above its absorption capacity.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.1: Consider Functional Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.1.B.6: Preference was given to Main Operating Bases that are easily accessible from the support community.

CRITERION DEFINITION: Accessibility to the support community is the distance from the Main Operating Base in road miles to the border of the nearest support community. A support community is one that is of sufficient size to provide typical services (greater than 25,000 population).

CRITERION RATIONALE: Close proximity of a support community enhances the likelihood that public and private sectors can respond to induced demands for goods, services, and facilities. Close proximity also minimizes the time required for transport of services and personnel that normally report to the Main Operating Base before going to the deployment area.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.2: Consider Land Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.2.B.1: Preference was given to Main Operating Bases with adequate land for locating the Hard Mobile Launcher system facilities and other components without functional land use concerns.

CRITERION DEFINITION: Available land on base is the quantity of land with characteristics to accommodate the Hard Mobile Launcher mission.

CRITERION RATIONALE: Available land on an existing Main Operating Base is required to efficiently support the mission and to provide the capability for timely construction of critical facilities to meet the Initial Operational Capability need date. Available land must be suitable to support standard construction methods and minimize impacts to existing uses.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.2: Consider Land Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.2.B.2: Preference was given to Main Operating Bases that contain available land with ownership that would minimize the time of official land use change for support of the Small ICBM system.

CRITERION DEFINITION: Land ownership is the owner/manager of land on the Main Operating Base that is potentially available for the Hard Mobile mission.

CRITERION RATIONALE: The order of preference for ownership of available land on base is DoD fee-owned, DoD leased land, DoD withdrawn land. The rationale for ordering the land ownership categories arises from consideration of different time durations required to change the official land use of land with these ownership types. DoD fee-owned land poses the least time constraint while DoD withdrawn land may entail the longest and most complicated change of land use and presents the greatest schedule risk.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.1: Preference was given to Main Operating Bases where sufficient water can be developed or obtained by appropriation or purchase/transfer for operations and limited construction.

CRITERION DEFINITION: A Main Operating Base is deemed to have sufficient water for operations and construction of the Hard Mobile system when the water can be obtained without exercising condemnation.

CRITERION RATIONALE: Availability of water affects both system constructibility and operability. It is preferable to develop unused water or purchase/transfer water from existing uses.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.2: Preference was given to Main Operating Bases with power systems that can meet project requirements.

CRITERION DEFINITION: Project requirement for power is the amount of power needed from public/private utilities plus any co/self generation systems to meet the Small ICBM system construction and operational requirements.

CRITERION RATIONALE: Deployment costs are reduced when existing power systems are adequate or can be easily expanded to accommodate project demands.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.3: Preference was given to Main Operating Bases with heating systems that can meet project requirements.

CRITERION DEFINITION: The project will require an on-base heating system with adequate excess capacity to accommodate the Small ICBM mission, or a system that could easily be expanded to meet project requirements.

CRITERION RATIONALE: Deployment costs are reduced when no modifications to the existing heating system are required. If modifications are required, cost would be minimized if the existing system could easily be expanded.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.4: Preference was given to Main Operating Bases with waste-water treatment and collection systems that can meet project requirements.

CRITERION DEFINITION: The project will require a waste-water treatment and collection system that can accommodate the Small ICBM mission.

CRITERION RATIONALE: Cost of new facilities will be reduced to the degree that existing waste-water treatment and collection systems are capable of accommodating growth.



GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.5: Preference was given to Main Operating Bases with solid waste disposal systems that can meet project requirements.

CRITERION DEFINITION: The project will require a solid waste disposal system that is capable of accommodating the Small ICBM mission.

CRITERION RATIONALE: Siting and development of new landfills is a lengthy and complex process. Cost and land requirements are lessened if existing landfill or disposal systems are large enough to accommodate growth.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.3: Consider Infrastructure Support Capability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.3.B.6: Preference was given to Main Operating Bases with storm drainage systems that can meet project requirements.

CRITERION DEFINITION: The project requires a storm drainage system capable of accommodating increased runoff.

CRITERION RATIONALE: Additional runoff from Small ICBM related construction and facilities may cause flooding and affect water quality if existing capacities are exceeded. Presence of existing storm drainage systems capable of accommodating growth will reduce the cost of new facilities.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.1: Preference was given to Main Operating Bases with capable airfields.

CRITERION DEFINITION: Airfield capability is a function of length, instrument capability, and location of a runway relative to the base.

CRITERION RATIONALE: The presence of an airfield provides flexibility in logistics support and travel.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availabilty

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.2: Preference was given to Main Operating Bases with adequate highway access.

CRITERION DEFINITION: Highway access is determined by type, capacity, and location of access roads, quality of interface with base roads, and congestion.

CRITERION RATIONALE: Adequate highway access facilitates movement of missile components, maintenance equipment, and personnel on and off base.

GOAL 2: Optimize System Operability

SUBGOAL 2.3: Maximize Main Operating Base Effectiveness

OBJECTIVE 2.3.4: Consider Transportation Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.3.4.B.3: Preference was given to Main Operating Bases with railroad freight service.

CRITERION DEFINITION: Railroad freight service is the existence of a railroad line, or spur, within the vicinity of the Main Operating Base that could support the Small ICBM mission.

CRITERION RATIONALE: Railroad freight service allows missile components and general supplies to be transported directly to the base. Existing on-base capacity and/or rights-of-way from the existing railroad freight service to the Main Operating Base reduces costs of land acquisition and construction for rail extension.

**GOAL 2: Optimize System Operability**

**SUBGOAL 2.4: Maximize Mission Compatibility**

**OBJECTIVE 2.4.1: Minimize Mission Conflicts**

**LEVEL OF APPLICATION: B - Area Evaluative**

**CRITERION STATEMENT 2.4.1.B.1:** Preference was given to Candidate Deployment Installations that could accommodate larger expanses of random movement and command dispersal areas with less interference to existing or projected range use activities.

**CRITERION DEFINITION:** Random movement area is area required to support day-to-day operations, with at least 8 square miles of effective area per Hard Mobile Launcher. Command dispersal area is the area required during periods of increased tension, and equals at least 16 square miles of effective area per Hard Mobile Launcher. Effective area is that area that would be covered with lethal overpressures from an attack on the suitable area and the existing road network, which goes through otherwise inaccessible terrain that is outside of legal/regulatory exclusion areas and cantonment areas. Suitable area is that area that is trafficable (Criterion 1.1.1.A.1), lies outside of legal/regulatory exclusion areas (Criteria 5.3.1.A.1, 5.3.1.A.2, 5.3.1.A.3, 5.3.1.A.4, and 5.3.1.A.5) and is not within excluded mission areas including the installation's cantonment area (Criterion 2.4.1.A.4).

**CRITERION RATIONALE:** Less interference with existing or projected range use activities would ensure that other national priorities could continue to be met while maintaining an operationally efficient Hard Mobile Launcher system.

GOAL 2: Optimize System Operability

SUBGOAL 2.4: Maximize Mission Compatibility

OBJECTIVE 2.4.1: Minimize Mission Conflicts

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.4.1.B.2: Preference was given to complexes that could accommodate larger expanses of random movement and command dispersal areas on their associated Candidate Deployment Installations with less interference to existing or projected range use activities.

CRITERION DEFINITION: Random movement area is area required to support day-to-day operations, with at least 8 square miles of effective area per Hard Mobile Launcher. Command dispersal area is the area required during periods of increased tension, and equals at least 16 square miles of effective area per Hard Mobile Launcher. Effective area is that area that would be covered with lethal overpressures from an attack on the suitable area and the existing road network, which goes through otherwise inaccessible terrain that is outside of legal/regulatory exclusion areas and cantonment areas. Suitable area is that area that is trafficable (Criterion 1.1.1.A.1), lies outside of legal/regulatory exclusion areas (Criteria 5.3.1.A.1, 5.3.1.A.2, 5.3.1.A.3, 5.3.1.A.4, and 5.3.1.A.5) and is not within excluded mission areas including the installation's cantonment area (Criterion 2.4.1.A.4).

CRITERION RATIONALE: Less interference with existing or projected range use activities would ensure that other national priorities could continue to be met while maintaining an operationally efficient Hard Mobile Launcher system.

GOAL 2: Optimize System Operability

SUBGOAL 2.4: Maximize Mission Compatibility

OBJECTIVE 2.4.1: Maximize Integration Potential

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.4.2.B.1: Preference was given to Main Operating Bases that have a support infrastructure that is compatible with Air Force and Small ICBM operations.

CRITERION DEFINITION: Compatible support infrastructure is the degree to which the current operating command is similar to that of the Small ICBM mission. The order of preference for operating command is: (1) existing ICBM, (2) Strategic Air Command as the host major command, (3) Air Force (any other major command), and (4) other military.

CRITERION RATIONALE: Because the Hard Mobile Launcher is an Air Force mission and Strategic Air Command is the operating command, greater potential efficiencies could result from deployment at an existing Strategic Air Command base through use of appropriate facilities and experienced personnel. Mission and organizational compatibilities are greater within the Air Force than between the Air Force and other branches of services, as well as within military organizations rather than between military and non-military organizations.



GOAL 2: Optimize System Operability

SUBGOAL 2.5: Maximize Quality of Life

OBJECTIVE 2.5.1: Provide Adequate Support Services

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.5.1.B.1: Preference was given to Main Operating Bases within 25 radial miles of a larger developed area (city, Census Designated Place, Urbanized Area).

CRITERION DEFINITION: A developed area is a support community that is of sufficient size and proximity to the Main Operating Base to provide typical services.

CRITERION RATIONAL: Basing within 25 miles of a support community enhances the likelihood that public and private sectors can respond to induced demands for goods, services, and facilities. Size of a support community is a surrogate measure of the community's ability to provide a full range of public services, merchandise, entertainment, and recreational activities for government employees.

GOAL 2: Optimize System Operability

SUBGOAL 2.5: Maximize Quality of Life

OBJECTIVE 2.5.1: Provide Adequate Support Services

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 2.5.1.B.2: Preference was given to Main Operating Bases with greater housing availability.

CRITERION DEFINITION: Housing is unaccompanied personnel quarters, military family housing, and off-base housing.

CRITERION RATIONALE: It is desirable to ensure that adequate and affordable housing is available on or near a Main Operating Base, thereby minimizing the need to construct new housing.

GOAL 4: Minimize Public Impact

SUBGOAL 4.1: Minimize Economic Impacts

OBJECTIVE 4.1.5: Minimize Impacts on Resource  
Availability

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.1.5.B.1: Preference was given to Main Operating Bases where water is available to meet the needs of the existing population and the additional project requirements.

CRITERION DEFINITION: An area will be deemed to have sufficient water when water resources and the water system can be developed to meet the needs of both the support community and Main Operating Base.

CRITERION RATIONALE: Availability of water affects both system constructibility and operability. It is preferable to develop unused water or purchase/transfer water from existing uses. It is desirable to avoid areas where present use is depleting local water supplies and where additional demands on the Main Operating Base and the support communities' water-supply systems will seriously stress the systems.

GOAL 4: Minimize Public Impact

SUBGOAL 4.2: Maximize Public Safety/Security

OBJECTIVE 4.2.3: Minimize Public Exposure to Risk

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.2.3.B.1: Preference was given to Main Operating Bases that minimize the necessity for travel of Hard Mobile Launchers through urban areas.

CRITERION DEFINITION: Urban areas are defined as areas designated by the Census Bureau as urbanized areas, census-designated places, and incorporated areas.

CRITERION RATIONALE: The potential for safety and security incidents is assumed to increase with increased traffic flows as found in urban areas.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.1: Preference was given to Main Operating Bases in areas of large nonrural populations.

CRITERION DEFINITION: Nonrural population is population in urbanized areas, in cities, and in census-designated places outside urbanized areas in all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: Large population centers reduce the need to provide new public services and facilities and are best able to minimize social disruption of host residents.

**GOAL 4: Minimize Public Impact**

**SUBGOAL 4.3: Minimize Social Impacts**

**OBJECTIVE 4.3.1: Minimize Social Disruption**

**LEVEL OF APPLICATION: B - Area Evaluative**

**CRITERION STATEMENT 4.3.1.B.2:** Preference was given to Main Operating Bases in areas that have available labor.

**CRITERION DEFINITION:** Available labor is measured within all counties either wholly or partially within 50 miles of a Main Operating Base.

**CRITERION RATIONALE:** A constrained labor supply may limit opportunities for satisfying direct and indirect labor demand locally and thereby increase the likelihood of induced immigration. This is especially true of the critical induced demand for construction labor, which can lead to rapid fluctuations in population. Low rates might also drive up the cost of labor and create sector-specific labor shortages as more job switching occurs. Areas of high unemployment may afford the greatest productivity benefits.

GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.1: Minimize Social Disruption

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.1.B.3: Preference was given to Main Operating Bases in areas with a diverse economic base.

CRITERION DEFINITION: Economic diversity is measured by the relative concentrations of sector-specific export industries at the two-digit Standard Industrial Classification level in all counties either wholly or partially within 50 miles of the Main Operating Base.

CRITERION RATIONALE: Induced immigration may be minimized if many industry types are strongly represented locally and have the capacity to respond to project-related purchases.

**GOAL 4: Minimize Public Impact**

**SUBGOAL 4.3: Minimize Social Impacts**

**OBJECTIVE 4.3.1: Minimize Social Disruption**

**LEVEL OF APPLICATION: B - Area Evaluative**

**CRITERION STATEMENT 4.3.1.B.4:** Preference was given to Main Operating Bases in areas with subgroup populations similar to those induced by project construction and operation.

**CRITERION DEFINITION:** Population similarity was measured in terms of the relative military and construction employment in all counties either partially or wholly within 50 miles of a Main Operating Base.

**CRITERION RATIONALE:** The extent to which the resident population matches the induced immigrating population in terms of the demographic characteristics defined above determines, in large part, the degree to which residents notice change. It is assumed that assimilation of induced population could best occur in a host area containing larger populations with similar characteristics.



GOAL 4: Minimize Public Impact

SUBGOAL 4.3: Minimize Social Impacts

OBJECTIVE 4.3.2: Minimize Adverse Impacts on Public Finance

LEVEL OF APPLICATION: B - Area Evaluative

CRITERION STATEMENT 4.3.2.B.3: Preference was given to Main Operating Bases where areas of potential socioeconomic influence contain jurisdictions that exhibit an adequate taxing effort.

CRITERION DEFINITION: Taxing effort is an indicator of the ability of the local tax structure to respond to an increased need for public services in a timely manner, and is measured by the quotient of total own-source revenues over total local income in all counties either wholly or partially within 50 miles of a Main Operating Base.

CRITERION RATIONALE: Rapid growth often generates the need for increased capital and operating expenditures. Public entities that are constrained in their ability to raise tax revenues in the short term due to political or legal limitations may face fiscal adjustment problems. Areas with a relatively high tax effort are able to capture more benefits (revenues) from the project.

**GOAL 4: Minimize Public Impact**

**SUBGOAL 4.3: Minimize Social Impacts**

**OBJECTIVE 4.3.3: Minimize Impacts on Community Support Capability**

**LEVEL OF APPLICATION: B - Area Evaluative**

**CRITERION STATEMENT 4.3.3.B.1:** Preference was given to Main Operating Bases in areas with larger supplies of available housing.

**CRITERION DEFINITION:** Available housing supply is defined as the number of vacant dwelling units for all unit types in all counties either wholly or partially within 50 miles of a Main Operating Base.

**CRITERION RATIONALE:** An adequate housing supply can accommodate immigration more efficiently by reducing the need for extending infrastructure and expanding public services.

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APPENDIX D

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT

BASING MODE

CANDIDATE DEPLOYMENT INSTALLATION EVALUATION

SENSITIVE

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APPENDIX D

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APPENDIX D

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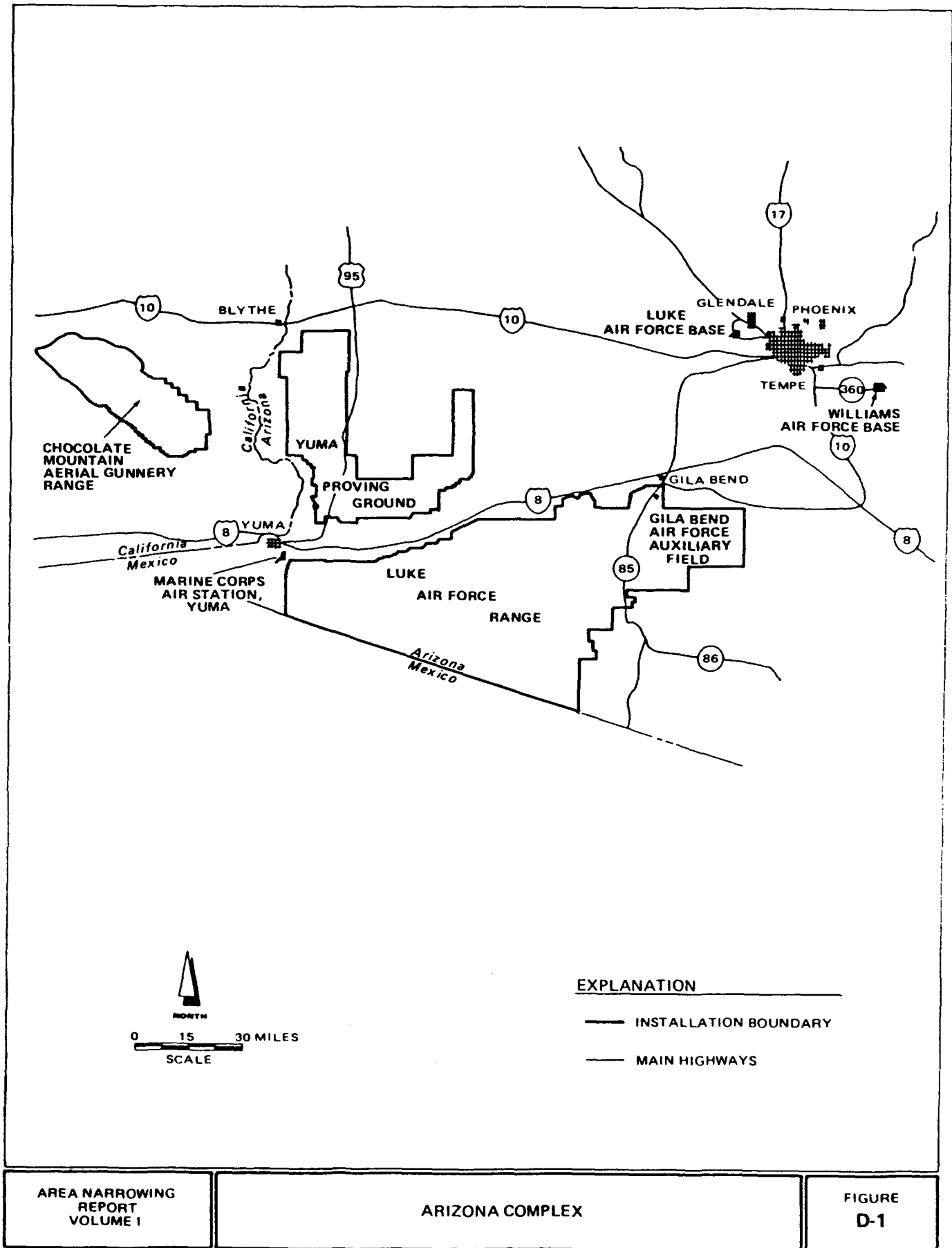
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ARIZONA COMPLEX

FIGURE  
D-1

D-1 Arizona Complex

The Candidate Deployment Installations within the Arizona Complex are Chocolate Mountain Aerial Gunnery Range, Luke Air Force Range, and Yuma Proving Ground (Figure D-1). After application of Evaluative Criteria, Chocolate Mountain Aerial Gunnery Range was eliminated because it offers limited random movement area, accessibility to the deployment area is constrained, and the distances from the Main Operating Base to the deployment areas are excessive. Luke Air Force Range and Yuma Proving Ground remain for further study; however, no determination is made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.





**FIGURE  
D-1-1**

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D-1.1 Chocolate Mountain Aerial Gunnery Range,  
California

After evaluating its contribution to the Arizona Complex, Chocolate Mountain Aerial Gunnery Range (AGR) was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-1-1), and the identification of current mission land use with regard to Small ICBM operations, indicate that there remains insufficient deployment area available on this installation to warrant further investigation.

Description: Chocolate Mountain AGR is situated in the Chocolate Mountains in southeastern California. To the east lie the Cibola National Wildlife Refuge and the Yuma Proving Ground, 13 miles and 23 miles away, respectively. Interstate 10 runs east-west about 10 miles north of the range's north end, while State highways 11 and 78 loop around the west and south portions of the installation, respectively. The range is 30 miles southwest of Blythe, California, and is operated by the Navy.

The total land area of Chocolate Mountain AGR is 718 square miles. The Chocolate Mountain AGR is 48 percent fee-owned land, 2 percent exchanged land (previously state-owned), and 50 percent land withdrawn for

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military use. Withdrawn land is concentrated in the northern quarter and southern tip of the range. The south-central portion of the range contains a random checkerboard pattern of withdrawn, fee-owned, and exchanged land. Numerous outgrant easements are in effect for utilities, roads, and railroads, which cross the base in various areas.

Chocolate Mountain AGR is located in the Sonoran Desert and Salton Sea Trough sections of the Basin and Range physiographic province, an area characterized by narrow mountain ranges and broad alluvial valleys. Effective area is most prevalent along the perimeter of the range, primarily on alluvial fan deposits flanking the Chocolate Mountains. Slopes in excess of 25 percent within the Chocolate Mountains constitute 63 square miles of installation land. This geotechnical constraint reduces the effective area for systems operation to 655 square miles. No improved roads are known to occur on the range; however, several jeep trails and gravel roads traverse much of the range area. The Niland-Blythe Road also traverses the central part of the range from east to west.

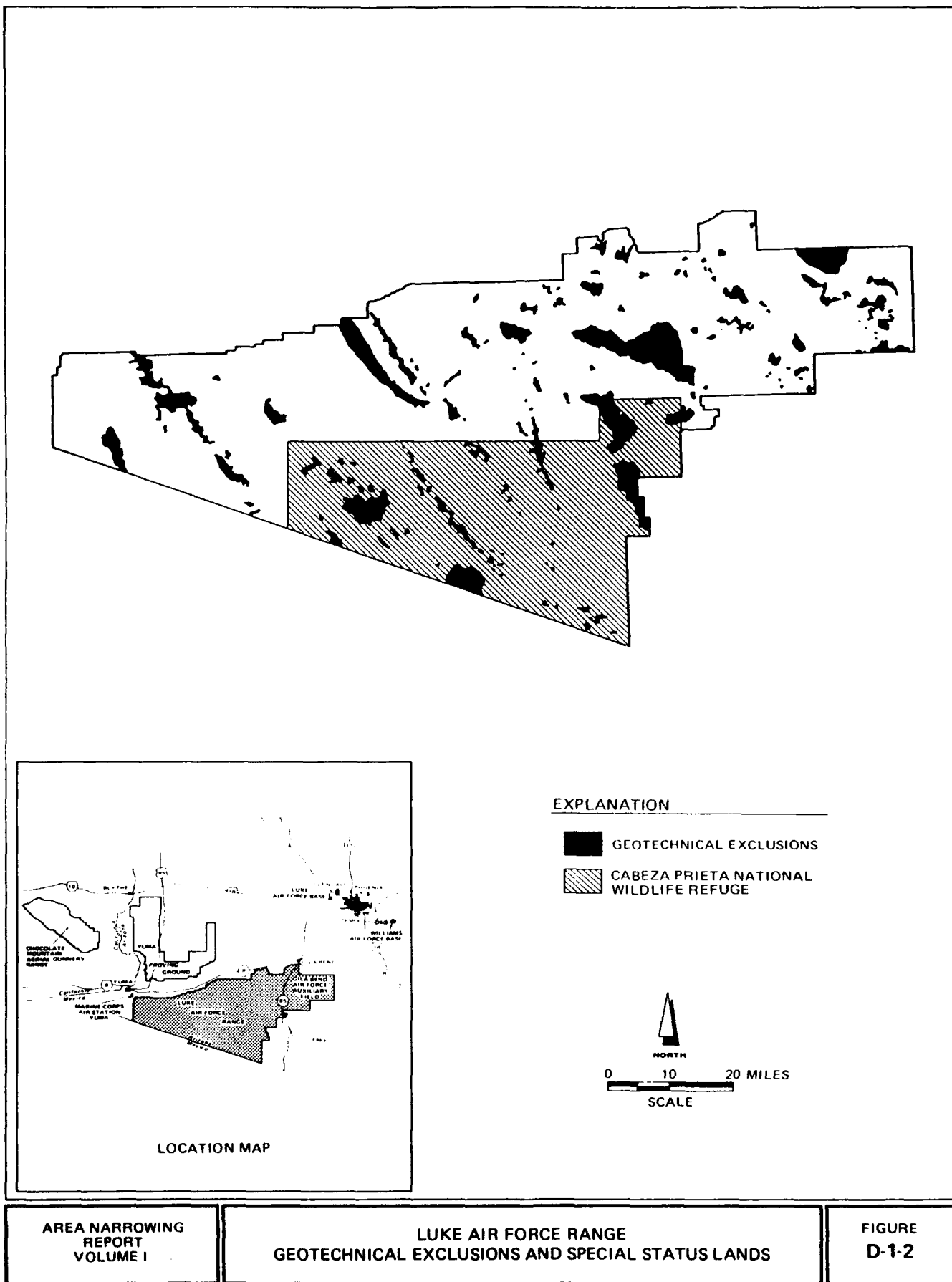
Mission Compatibility Issues/Accessibility of

Deployment Area: Chocolate Mountain AGR is used primarily by the Navy and Marine Corps for air-to-air

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and air-to-ground training. The major portion of the range is designated as a hazardous area with relatively little remaining suitable area unencumbered by mission conflicts. An air-to-air gunnery range extends almost the entire length of the range. High explosive weapon delivery areas occur throughout the range, except in the northwest quadrant, which is designated for inert weapons delivery. The remaining area within the Restricted Airspace is designated as hazardous area, due to inadvertent weapon release, explosive safety distances, and the possible presence of unexploded ordnance. Only a relatively small area (approximately 60 square miles) on the range exists outside the restricted airspace and would be available for random movement of the Hard Mobile Launcher.

Accessibility of a large proportion of the deployment area to the Hard Mobile Launchers could be difficult.



D-1.2 Luke Air Force Range, Arizona

Luke Air Force Range (AFR) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-1-2), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area could be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: The Luke AFR is located in southwestern Arizona, 15 miles south of the Yuma Proving Ground, 50 miles southwest of Phoenix, 85 miles west of Tucson, and 10 miles east of the city of Yuma. The range is bounded on the south by the Mexican border, and on the east by the Papago Indian Reservation and the Organ Pipe Cactus National Monument. Interstate 8 runs just outside the northern boundary of the range.

The total land area of Luke AFR is 4,171 square miles. Approximately 64 percent of the Luke AFR consists of land withdrawn for military use. The Cabeza Prieta National Wildlife Refuge, located in the south-central portion of the range, occupies another 32 percent of the area. The remaining 4 percent of the land area is

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leased from the state of Arizona, U.S. Bureau of Reclamation, and private land owners. Except for a large block of state land near the north end of the Mohawk Mountains, leased lands generally consist of small plots near the northwestern and western base boundaries. The southern boundary of the range is formed by the border between the United States and Mexico.

Luke AFR is located within the Sonoran Desert of the Basin and Range physiographic province. The dominant topographic features are northwest-trending mountain ranges and intervening alluvial valleys, which control the distribution of effective area. The mountains restrict movement between valleys to a few trails traversing low mountain passes. Access to the majority of the range is limited to a few unimproved dirt roads. Mountain slopes generally exceed 25 percent and cover approximately 456 square miles of the range area. The upper flanks of most alluvial valleys contain numerous drainages with incision depths exceeding 3 feet. Drainages of this magnitude may be potential obstacles to mobility. Effective area is also reduced by semi-stabilized sand dunes, which occur along the west side of Mohawk Valley, and by several lava flows, the largest of which occurs near Sentinel, along the north-central range boundary. Sand dunes and blocky

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lava flows together cover about 383 square miles of the range. A combination of geotechnical factors, with consideration of their areal overlap, reduces the potential effective area for system operation to 3,460 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launcher results in an increase of the effective area to 3,556 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: Luke Air Force Range is divided into two halves, the western half controlled by the Marine Corps from the Marine Corps Air Station, Yuma, and the eastern half controlled by the Air Force out of Luke Air Force Base. The Marines perform primarily air-to-air combat training over Luke AFR. The eastern half of Luke AFR is utilized by the Tactical Air Command for both air-to-air and air-to-ground combat training. Although a large portion of the ground area is occupied by targets and their safety standoffs, there are areas around the perimeter of the range that are usable for random movement of the Hard Mobile Launchers. Mission Compatibility issues remain relative to impacts on the tactical training mission; scheduling; safety; security; command, control and communication effects; and joint use of the Cabeza Prieta National Wildlife Refuge.

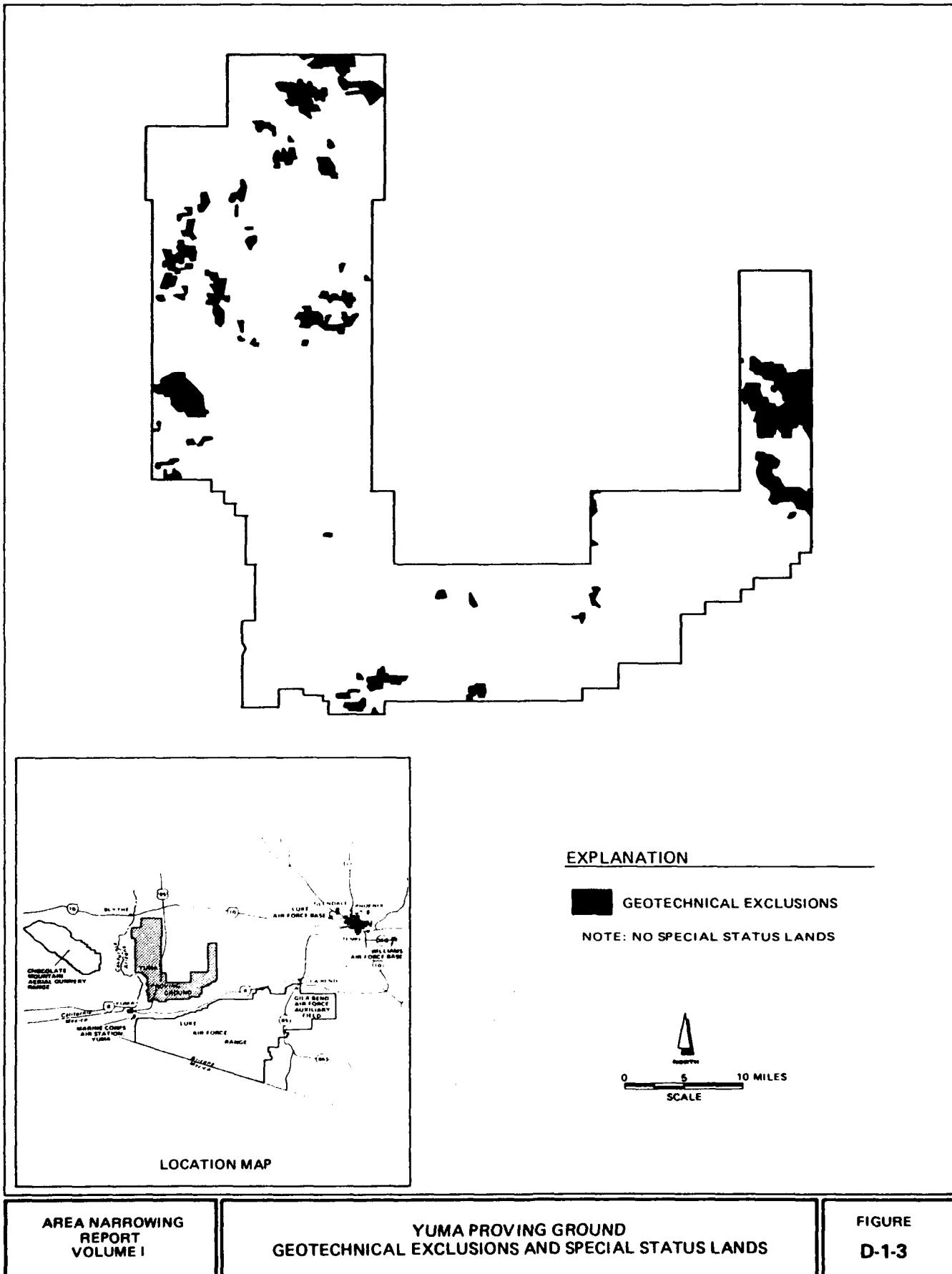


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Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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D-1.3 Yuma Proving Ground, Arizona

Yuma Proving Ground (PG) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-1-3), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area could be available for deployment of Hard Mobile Launchers. Actual availability depends upon resolution of remaining mission compatibility issues.

Description: Yuma PG, in southwestern Arizona, is located 15 miles north of the Luke Air Force Range, east of and adjacent to the Colorado River, and borders the Kofa Game Range on three sides. U.S. Highway 95 is routed through part of the installation.

Yuma PG, operated by the Army, is composed of four subranges: the North and South Cibola Ranges along the western leg of the installation, the Southern Kofa Firing Range that extends approximately 40 miles east-west, and the Eastern Kofa Firing Range that is situated along the eastern leg of the installation.

The total land area of Yuma PG is 1,310 square miles, composed of over 99 percent land withdrawn for military use. The remaining area consists of both state and

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privately leased land. A 42-square-mile parcel in the northernmost portion of the Cibola Range area is currently being returned to the public domain.

Yuma PG is located within the Sonoran Desert section of the Basin and Range physiographic province. The base terrain consists of broad open-basin (valley) conditions such as the La Posa Plain, King Valley, Castle Dome Plain, and Palomas Plain, and through-flowing drainages. The range configuration forms a broad U-shaped area with the Kofa Game Range occupying nearly the entire area separating the western and eastern sides of the base. Broad in extent but relatively low in relief, irregularly shaped, non-trending mountain ranges such as the Trigo, Tank, Palomas, and Chocolate mountains isolate and separate effective areas in the northwest and northeast areas with only trails through low passes to connect the areas. There are 134 square miles of base area with slopes greater than 25 percent. Blocky lava flows, found particularly along the eastern limb of the installation, encompass 42 square miles. Adverse terrain from deeply incised drainages, particularly in upper fan areas, is locally significant as an obstacle to mobility. A low density of paved and unimproved roads provides access mainly to range and mission use areas. Geotechnical factors combine to reduce the

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effective area for system operations to 1,145 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launcher results in an increase of the effective area to 1,153 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: Yuma PG is used by the Army to perform research and development, test and evaluation of new weapon systems, and training. The land area at Yuma is divided into the Cibola and Kofa Ranges. The Kofa Range is primarily used for artillery firing. Impact areas on this range would be restricted from Hard Mobile Launcher transit at all times. Hazard areas on the range could be available for command dispersal; however, Hard Mobile Launchers would have to remain on the roads in these areas to reduce the danger from unexploded ordnance. Approximately one-half of this range could be mission compatible for random movement. Approximately one-third of the Cibola Range is used for air-to-ground weapons delivery and ground-to-ground artillery firing. Most of the remainder of this range could be mission compatible with the Hard Mobile Launcher in Random Movement system. Mission compatibility issues remain relative to future activities expansion and command, control, and communications effects.

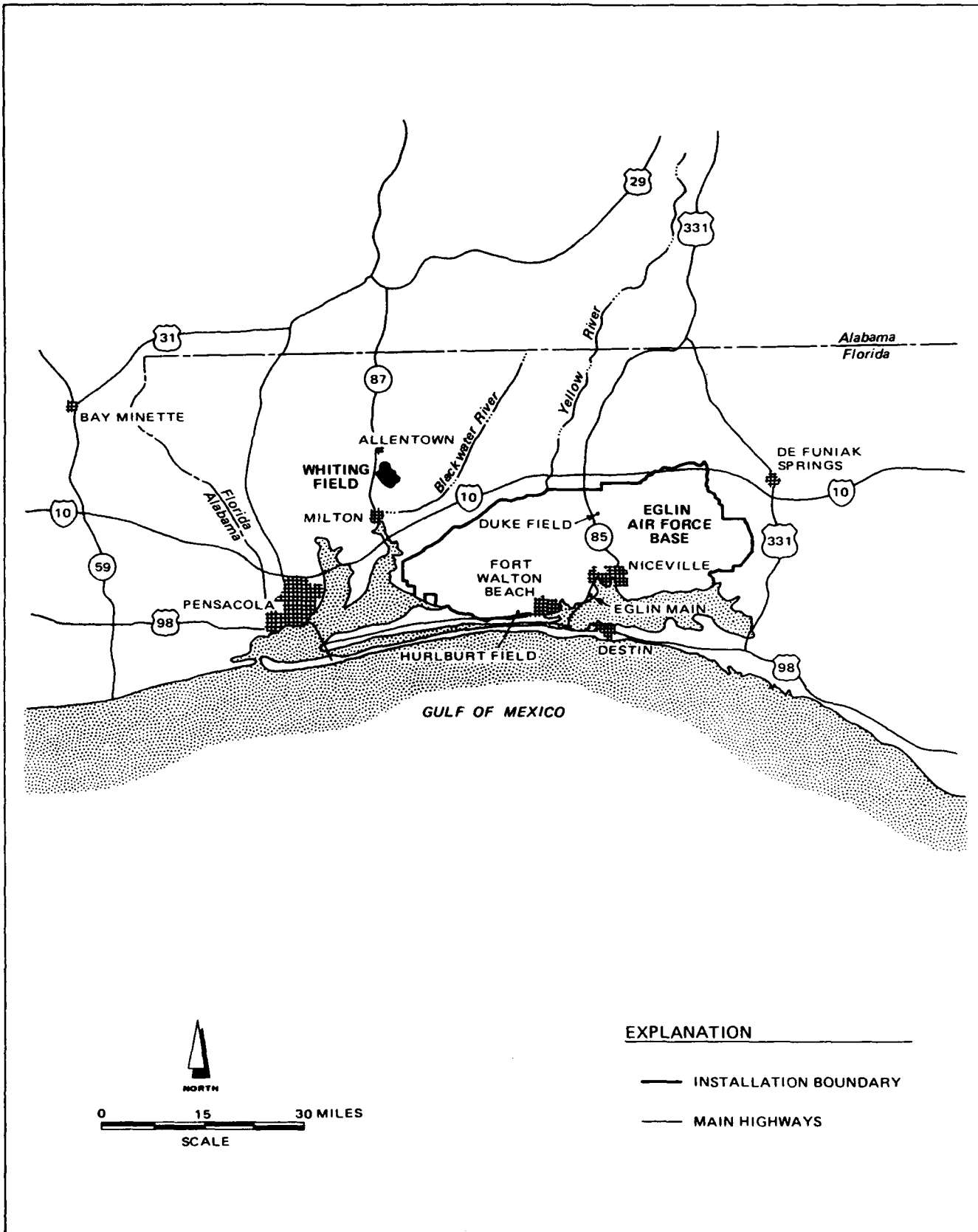
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Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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FIGURE  
D-2

D-2 Florida Complex

The Candidate Deployment Installation within the Florida Complex is Eglin Air Force Base (Figure D-2). After application of Evaluative Criteria, this installation remains for further study; however, no determination is made at this time regarding the overall advisability of using this Systems Command installation to support a Strategic Air Command mission.

D-2.1 Eglin Air Force Base, California

Eglin Air Force Base (AFB) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks, and the identification of current mission land use with regard to Small ICBM operations, indicate that land available on a day-to-day basis may be limited only by existing missions; however, sufficient land may be available for command dispersal and the installation offers significant strategic flexibility. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: Eglin AFB is located in northwestern Florida and is operated by the Air Force Systems Command (see Figure D-2). South of the base are Choctawhatchee Bay and the Gulf of Mexico, while the western border extends nearly to Pensacola Bay at several points. The Blackwater River State Forest lies 8 miles to the north. Eglin AFB contains portions of State highways 87, 85, and 20; Interstate 10 runs along or near the northern boundary; U.S. highway 98 is routed to the south; and U.S. Highway 331 touches the base's eastern border. Pensacola is 15 miles to the west of Eglin AFB, while Crestview to the north and Valparaiso to the south are both within 10 miles.

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The total land area of Eglin AFB is 723 square miles. Approximately 70 percent of Eglin AFB is DoD fee owned and 30 percent is withdrawn for military use. There are no state or privately owned lands on base, although the base is dissected by several strips of land outgranted for public highways. The main base airfield is shared by Okaloosa County Municipal Airport for commercial airline service. Approximately 7 square miles that contain sites of potential archaeological significance may be protected as a result of a current survey.

Eglin AFB is located on low-lying coastal marine terrace deposits. The base consists of small plains and low rolling hills that are dissected by numerous perennial streams. Elevations range from over 200 feet above mean sea level in the northeast to less than 30 feet above mean sea level along the southern base boundary. Perennial streams, swamps, and marshes constitute 53 square miles of base land. Eight square miles of sand dunes occur on the Santa Rosa Island; the island itself is isolated south of the main base area by Santa Rosa Sound and Choctawhatchee Bay.

Geotechnical factors combine to reduce the effective area for system operations to 657 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launcher

results in an increase of the effective area to 707 square miles.

Mission Compatibility Issues/Accessibility of

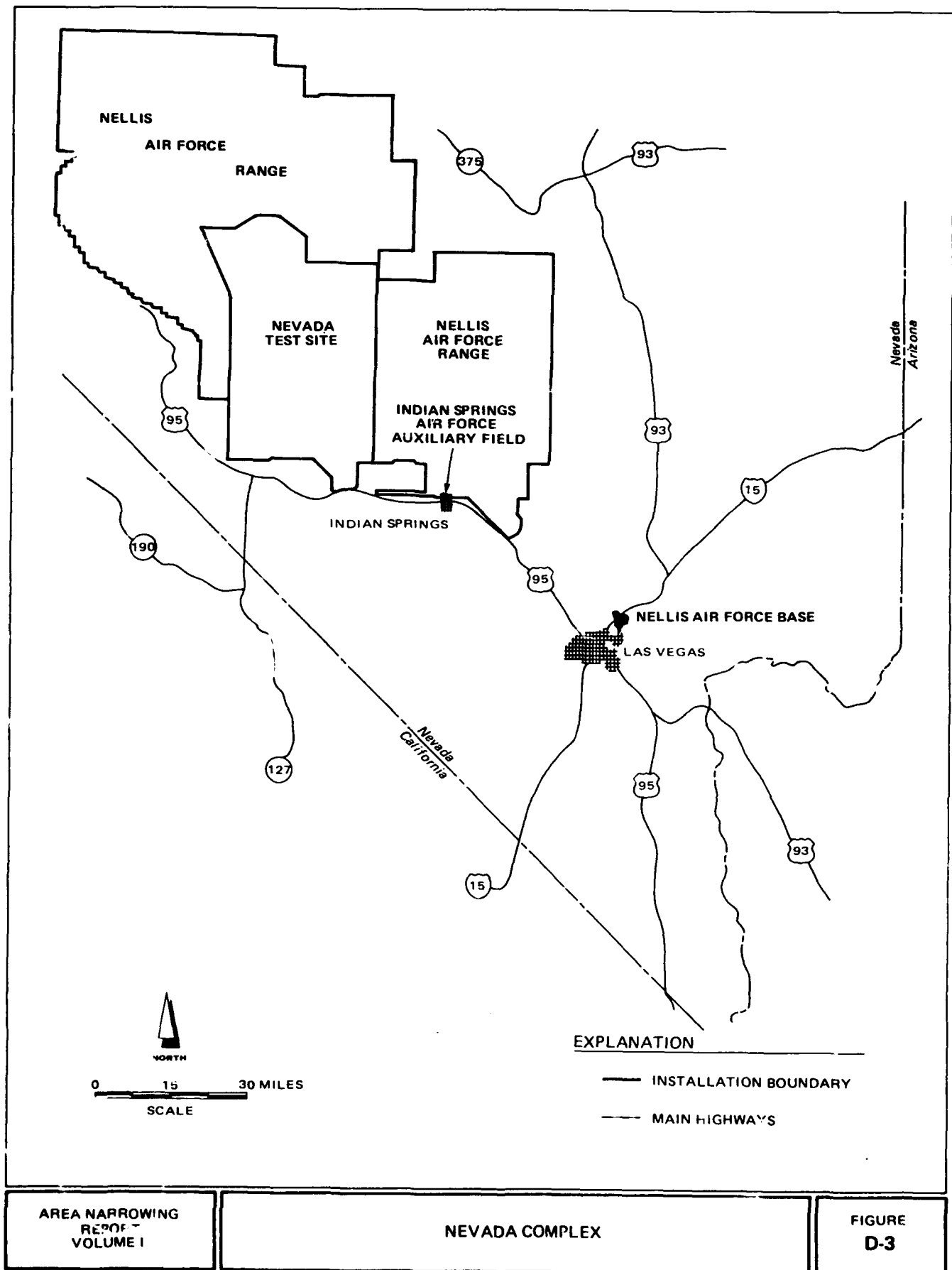
Deployment Area: Eglin AFB is used by the Air Force Systems Command, Armament Division, to perform weapons system research and deployment, test and evaluation of new weapons systems and training. There are a number of ranges used for live and inert ground-to-ground ordnance and air-to-ground weapons test and training. The live ordnance delivery areas are incompatible at all times, but the inert ordnance delivery areas could be available to Hard Mobile Launchers during periods of increased tension. With proper schedule coordination approximately 50 percent of the Random Movement Area could be available. Mission compatibility issues remain relative to future test activity expansion and scheduling.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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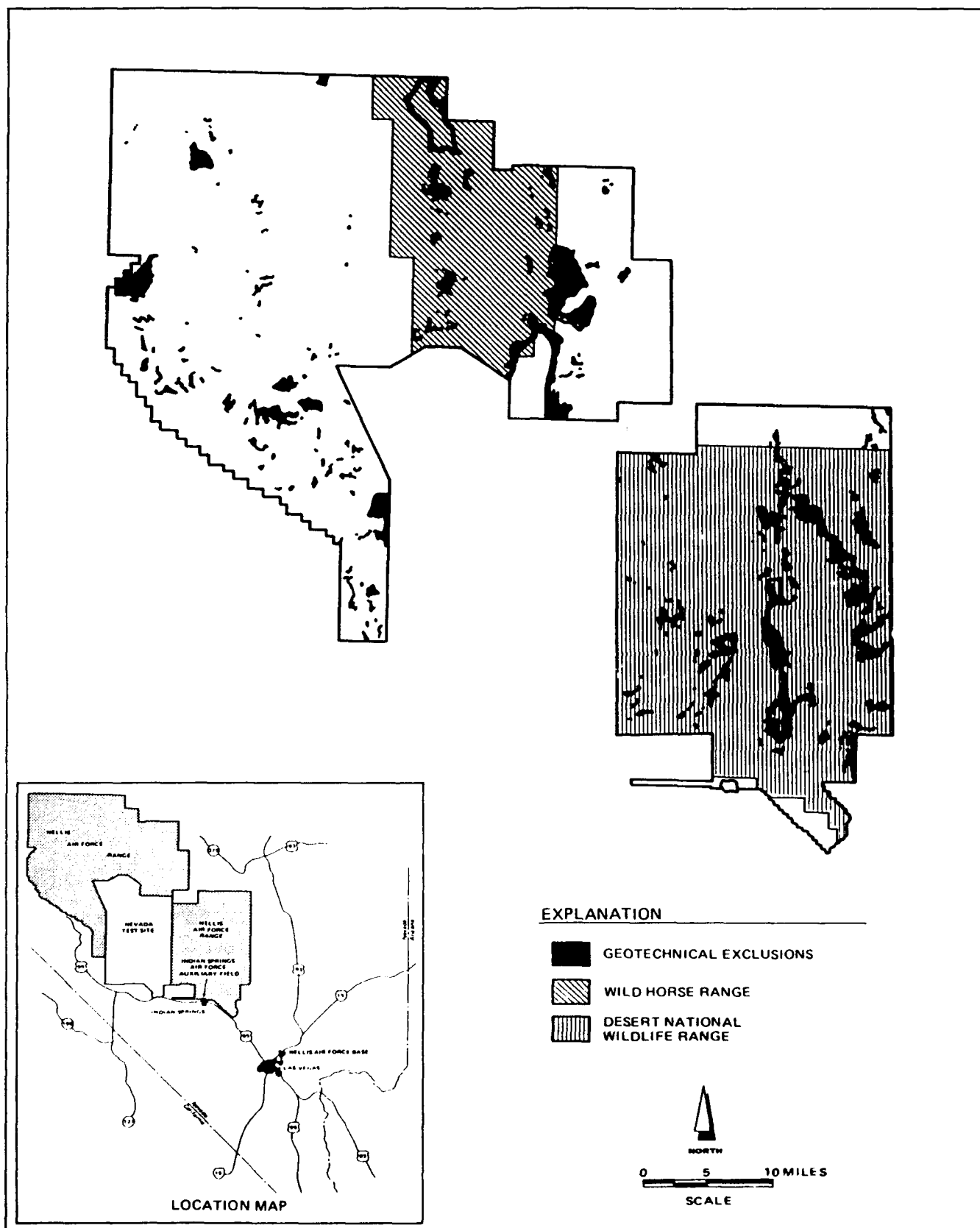


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D-3 Nevada Complex

The Candidate Deployment Installations within the Nevada Complex are the Nellis Air Force Range and the Nevada Test Site (Figure D-3). After application of Evaluative Criteria, both installations remain for further study; however, no determination is made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.





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NELLIS AIR FORCE RANGE/NEVADA TEST SITE  
GEOTECHNICAL EXCLUSIONS AND SPECIAL STATUS LANDS

FIGURE  
D-3-1

**D-3.1 Nellis Air Force Range, Nevada**

Nellis Air Force Range (AFR) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-3-1), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area could be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: Located approximately 22 radial miles northwest of Las Vegas, Nevada, Nellis AFR, operated by the Air Force Tactical Air Command, is ringed by Interstate 95, U.S. Highway 93, and State Highway 375. Death Valley National Monument lies about 20 miles to the southwest. For convenience of discussion the Nellis AFR can be divided into two ranges: the North Range, which is north and west of the Nevada Test Site, and the South Range, which is east of the Nevada Test Site.

The total land area of Nellis AFR is 4,690 square miles. More than 99 percent of Nellis AFR is land withdrawn for military use. The remaining lands include 368 acres of fee owned, and slightly more

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than 160 acres of patented lands, which are leased. In addition, the Desert National Wildlife Range encompasses most of the south range area. Most of Kawich Valley and the very eastern end of Cactus Flat are also part of the Nevada Wild Horse Range.

Nellis AFR is located within the Basin and Range physiographic province, an area characterized by linear northwest to northeast trending mountains separated by broad alluvial filled valleys. Pahute Mesa forms an east-west terminus to the northerly trending mountains. Effective area at Nellis AFR is most prevalent in the broad valleys scattered throughout the range, but is most extensive and contiguous in the northern and western portion of the range. Effective area for system operation is reduced by approximately 633 square miles due primarily to mountainous areas with slopes in excess of 25 percent. Effective area is further reduced in the southwest portion of the range by approximately 8 square miles of sand dunes and blocky lava flows. Large playas in the Three Lakes Valley, Indian Springs Valley, Gold Flats, and Stonewall Flat areas may further reduce effective area because of the potential for flooding and periodic standing water during wet seasons. These geologic features are mitigated by a sparse network of paved and bladed gravel roads that traverse the range. A small number

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of bituminous surfaced roads traverse the mountainous terrain in the Tolicha Park area; however, few roads enter the mountainous areas in other parts of the range.

The effective area for system operation that remains after consideration of these factors is 4,049 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launcher results in an increase of the effective area to 4,116 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: The Nellis AFR is divided into north and south ranges. The North Range is the larger of the two ranges and is used more frequently for Air Force Tactical Air Command activities. Large portions of the North Range are permanent mission incompatibility areas. Programmed actions will increase the permanent incompatibility now identified. Day-to-day random movement area may be available in areas designated for electronic combat emitters. These areas are restricted from air-to-ground delivery and air-to-air firings.

On the South Range the opportunities for day-to-day random movement of the Hard Mobile Launcher are seriously constrained by scheduling conflicts and temporary avoidance areas. The scheduling conflicts

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arise principally from frequent expansion of activities from sensitive mission areas, periodic evacuations due to underground testing on the adjacent Nevada Test Site, and, in the future, from liquid chemical spill tests conducted on the Nevada Test Site. Although there are several areas of permanent mission incompatibility, a substantial effective area remains that could be used for command dispersal during periods of heightened tensions.

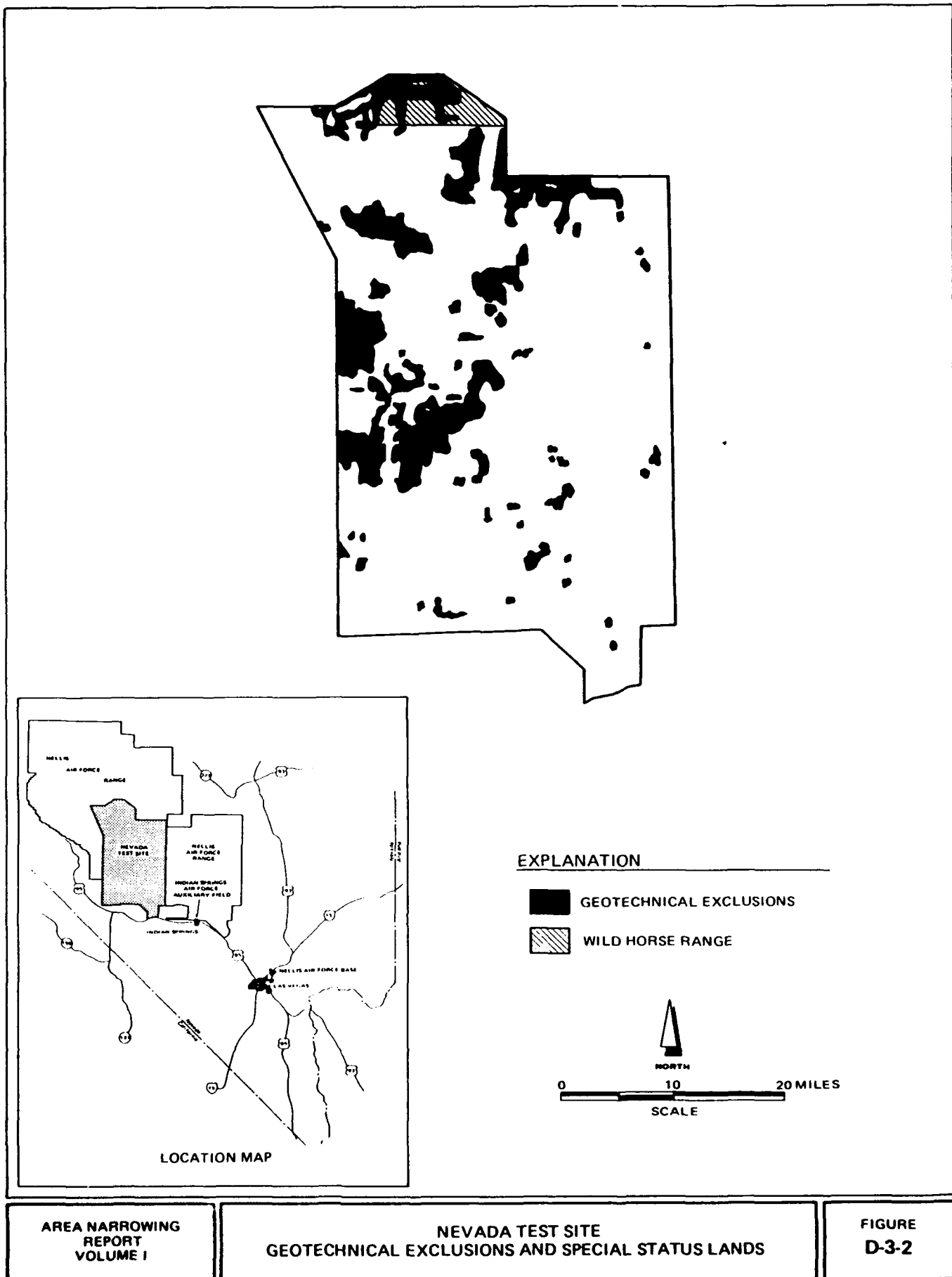
Mission compatibility issues remain relative to scheduling flexibility, joint use of wildlife ranges, Hard Mobile Launcher operability in a congested electromagnetic spectrum, and future mission impacts.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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D-3.2 Nevada Test Site, Nevada

The Nevada Test Site (NTS) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-3-2), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area could be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: The Nevada Test Site is located in southern Nevada, about 45 radial miles northwest of Las Vegas. The site is operated by the Department of Energy, and is bordered on three sides by the Nellis Air Force Range and on the south by Bureau of Land Management land. There is access from the south via Interstate 95. There is also access from the north due to a Letter of Agreement between Nellis Air Force Base and the Department of Energy employees at Nevada Test Site that allows the Department of Energy employees to use the unpaved road between Nevada State Highway 375 and gate 700 of the Nevada Test Site from 1645 hours until 0615 hours the following day.

The Nevada Test Site has a total area of 1,350 square miles. The Nevada Test Site is entirely controlled by the federal government, being composed entirely of land withdrawn for



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DoE use. A portion of the Nevada Wild Horse Range extends into the Pahute Mesa area.

The Nevada Test Site is located in the Basin and Range physiographic province, an area characterized by northwest to northeast trending mountain ranges and parallel intervening alluvial valleys. Effective area is concentrated in the southern portion of the Test Site around Jackass Flats and Buckboard Mesa with additional areas on Frenchman Flat and Yucca Flat. Underground nuclear tests conducted in the Yucca Flat area since the late 1950's have created adverse terrain in terms of numerous collapsed structures, which resulted from voids produced in the subsurface after underground explosions. Effective area is also reduced by approximately eight square miles of blocky lava flows just east of Timber Mountain on the west side of the Test Site. Mountainous areas that have slopes greater than 25 percent encompass about 231 square miles. Numerous paved bituminous and bladed gravel roads traverse the Test Site, making access to much of the area generally very good. The aggregate of these factors reduces effective area to 1,111 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launcher results in an increase of the effective area to 1,229 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: The Nevada Test Site can be divided into areas within which nuclear weapon testing/weapon development occur, areas where research and development activities are pursued, and areas reserved for future use. The testing/weapon development areas represent approximately one-third of the Nevada Test Site. The research and development areas and areas reserved for future use lie predominantly in hilly terrain, but an extensive road network through a portion of the areas provides opportunities for Hard Mobile Launcher movement. These two areas present scheduling constraints due to potentially required evacuation of personnel and equipment during underground blasts and, in the future, liquid spill tests. Potential selection of the Nevada Test Site for location of the High Level Commercial Radioactive Waste Repository would restrict Hard Mobile Launcher deployment in an area of at least 48 square miles. Because it is contiguous with the Nellis North and South Ranges, the Nevada Test Site could provide an opportunity for satisfactorily meeting scheduling coordination requirements on all three ranges. Specifically, the Nevada Test Site could provide an area for Hard Mobile Launcher staging prior to dispersal onto the Nellis South Range during heightened tensions. The Nellis North Range could

provide a retreat area for Hard Mobile Launchers if required during periods of evacuation of the Nevada Test Site.

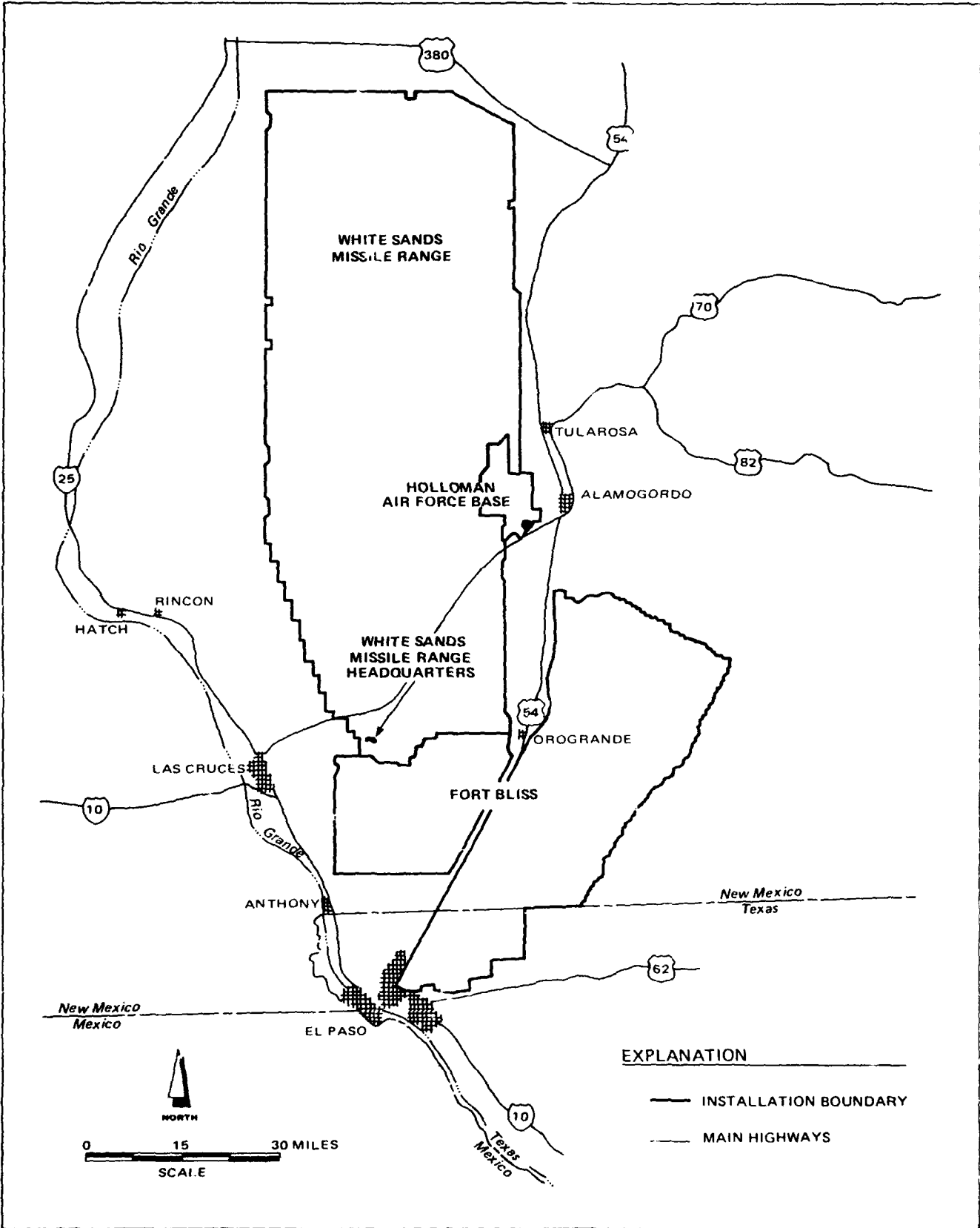
Mission compatibility issues remain relative to use of the land withdrawn exclusively for use of the Department of Energy, future DoE testing areas, use of existing roads, scheduling, and command and control of security forces.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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AREA NARROWING  
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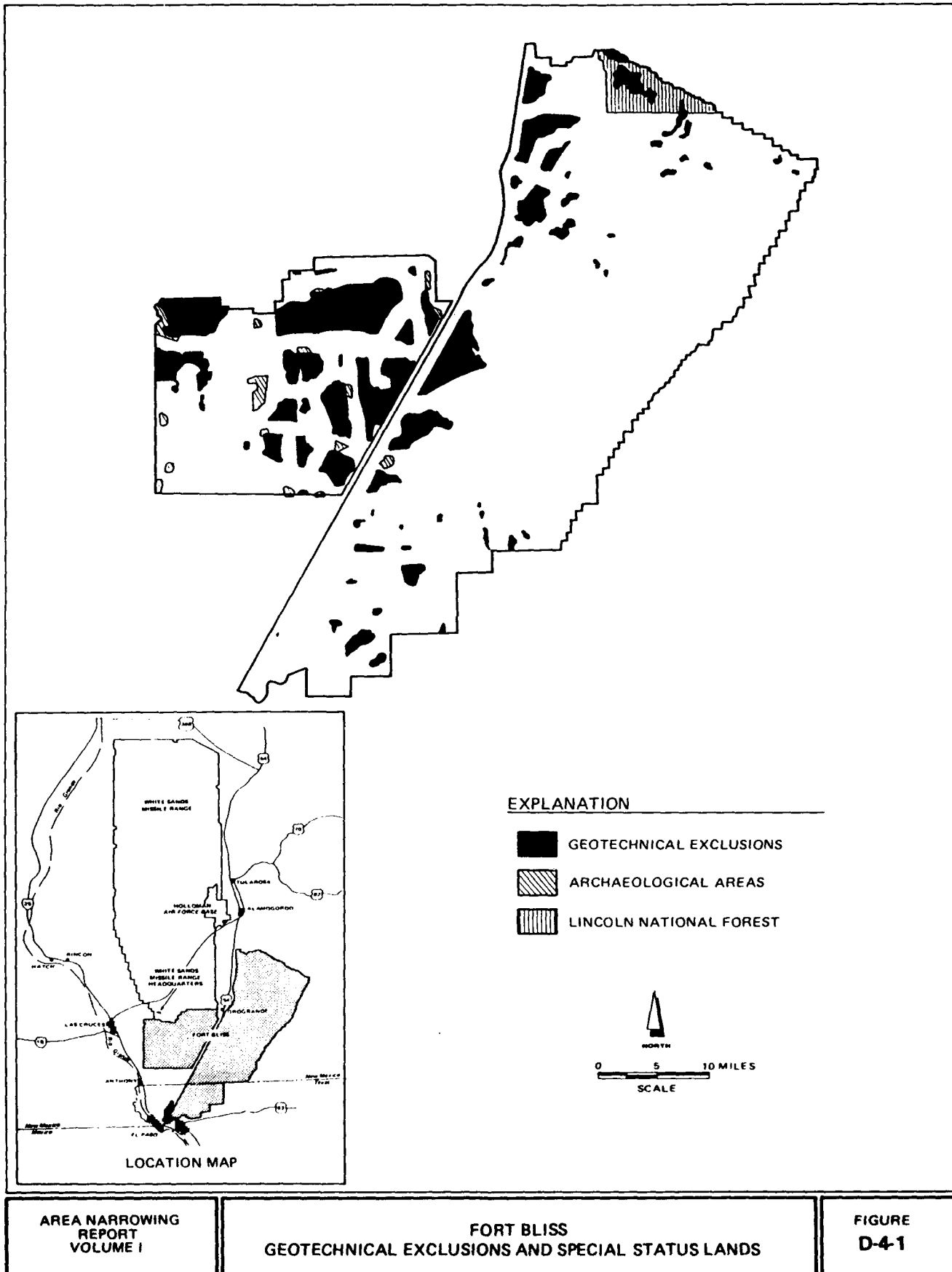
FIGURE  
D-4

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D-4 New Mexico/Texas Complex

The Candidate Deployment Installations within the New Mexico/Texas Complex are Fort Bliss, Holloman Air Force Base, and the White Sands Missile Range (Figure D-4). After application of Evaluative Criteria, all these installations remain for further study; however, no determination is made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.



D-4.1 Fort Bliss, Texas

Fort Bliss remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-4-1), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area may be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: Fort Bliss, operated by the Army, is bordered on the north by the White Sands Missile Range and the Lincoln National Forest; on the east by Bureau of Land Management lands; on the west by the Rio Grande River and Bureau of Land Management land; and on the south by El Paso and its surrounding communities. U.S. Highway 54 divides the installation into the Dona Ana/Orogrande and McGregor Ranges.

The total land area of Fort Bliss is 1,750 square miles. Fort Bliss is approximately 95 percent DoD fee owned land or land withdrawn for military use. Fee lands are concentrated in the cantonment area and scattered throughout the range, interspersed with public domain lands. Stateowned land, located east of the cantonment area, constitutes about 1.5 percent of



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the installation. The remaining area is land shared with Lincoln National Forest, located in the northern portion of the base. Many archaeological sites representing areas where prehistoric remains have been discovered are scattered throughout the Dona Ana Range.

Fort Bliss is located in the southeastern portion of the Basin and Range physiographic province. The area is characterized by the broad, alluvial, Tularosa Basin bounded on the west by the north-trending Franklin and Organ Mountains, on the east by the Otero Mesa, and on the northeast and southeast by the Sacramento and Hueco Mountain ranges, respectively. The Otero Mesa escarpment on the eastern side of the installation forms a mobility barrier traversed by occasional isolated roads. Within these mountains, 147 square miles of 25 percent or greater slope have been delineated. The central portion of the Tularosa Basin is covered by vegetated sand dunes that occupy 689 square miles. The dunes are traversed by Highway 54 and numerous roads. These factors, together with policy exclusions, reduce the effective area for system operation to 899 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of the effective area to 1,342 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: Fort Bliss is composed of the Dona Ana/Orogrande Range, the McGregor Missile Range, and the maneuvering areas south of the McGregor Range. The Dona Ana/Orogrande Range is intensely used for mechanized unit maneuvering and would require scheduling coordination to assure that there would be no mission interference during random movement and dispersal during heightened tensions.

The McGregor Range is used for missile/rocket firing, small arms firing, and attack helicopter gunnery. It offers an extensive area for Hard Mobile Launcher deployment. Most of the perimeter area of the McGregor Range is available for unconstrained use for random movement and command dispersal. Suitable area for dispersal during heightened tensions is available throughout the installation; however, movement would be restricted to the roads in the missile ranges due to the possible presence of unexploded ordnance that could be obscured from the drivers' vision.

The maneuvering areas to the south of the McGregor Range are heavily used by Army and National Guard units. Because no live fire is authorized in this area, scheduling coordination and construction of additional roads in this area could provide additional

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random movement area and area for dispersal during heightened tensions.

Mission compatibility issues exist relative to security, base support during mobilization, scheduling, joint use of Department of Agriculture lands, and system operability within a crowded electromagnetic spectrum.

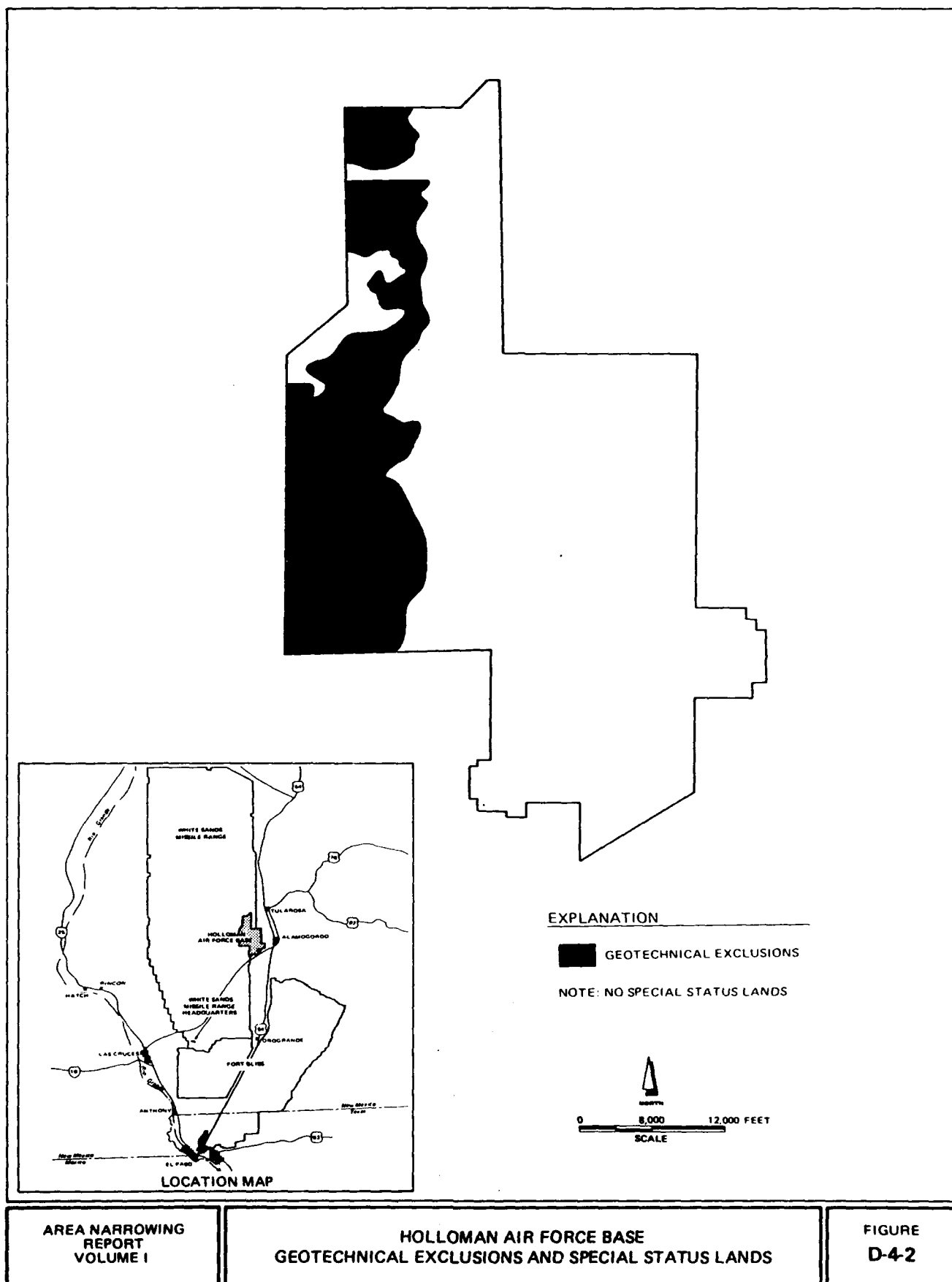
Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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D-4.2 Holloman Air Force Base, New Mexico

Holloman Air Force Base (AFB) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-4-2), and the identification of current mission land use with regard to Small ICBM operations indicate that a limited area remains that could be used effectively only in conjunction with the White Sands Missile Range. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: Holloman AFB, which is operated by the Air Force Tactical Air Command, is bounded on the west side by White Sands Missile Range, and is within 15 miles of Tularosa and Alamogordo, New Mexico. U.S. Highway 70 passes just south of Holloman AFB.

The total land area of Holloman AFB is 75 square miles. Holloman AFB is entirely under federal control; more than 87 percent is land withdrawn for military use, approximately 6 percent is fee-owned land, and 7 percent is leased land. Fee-owned land is concentrated in the cantonment area. Lands leased from non-federal agencies and private individuals are generally scattered throughout the base.

Holloman AFB is located within the Basin and Range physiographic province, an area characterized by linear

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north-trending mountain ranges separated by broad alluvial basins. Terrain, drainage and soil conditions are generally favorable because the base is situated near the valley axis. The western 20 square miles of the base are covered by sand dunes; the remaining 55 square miles of the base constitute effective area. The base area is easily accessed by a well-developed road network. However, several deeply incised drainages, such as the Lost River, could reduce off-road mobility. The 10-mile-long sled track is an effective linear barrier to both on- and off-road access in the northern portion of the base. Consideration of installation roads and trails for potential movement of the Hard Mobile Launchers and removal of policy exclusions results in an effective area of approximately 46 square miles.

Mission Compatibility Issues/Accessibility of

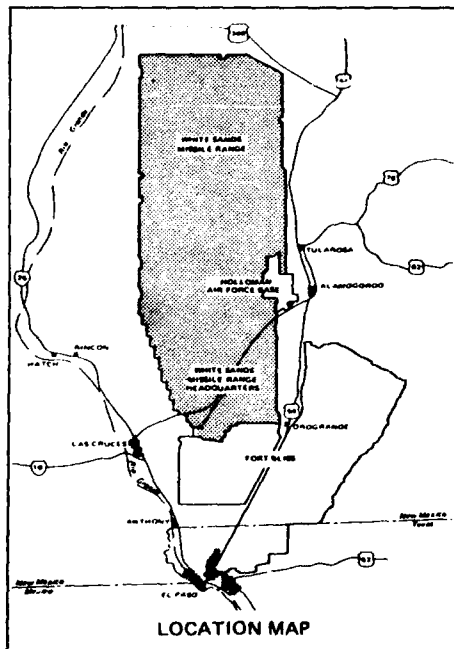
Deployment Area: Holloman AFB has compatible area contiguous with White Sands Missile Range, which could provide a corridor to connect potential random movement areas along the perimeter of White Sands Missile Range. Additionally, the mission compatible area could provide area for deployment of a few Hard Mobile Launchers.

Holloman AFB uses air-to-air and air-to-ground ranges on the White Sands Missile Range. Compatibility issues





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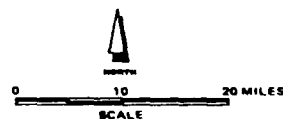
relative to range scheduling at White Sands are magnified with respect to Holloman AFB, which experiences a relatively low scheduling priority. Mission compatibility issues remain relative to potential flight safety restrictions, security, and impacts on tenant operations.





EXPLANATION

-  GEOTECHNICAL EXCLUSIONS
-  JORNADA EXPERIMENTAL RANGE
-  WHITE SANDS NATIONAL MONUMENT
-  SAN ANDREAS NATIONAL WILDLIFE REFUGE



AREA NARROWING  
REPORT  
VOLUME I

WHITE SANDS MISSILE RANGE  
GEOTECHNICAL EXCLUSIONS AND SPECIAL STATUS LANDS

FIGURE  
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D-4.3 White Sands Missile Range, New Mexico

White Sands Missile Range remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-4-3), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area may be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: White Sands Missile Range, operated by the Army, is located in south-central New Mexico, approximately 45 road miles north of El Paso, Texas, and the Mexican border, and 21 road miles east of Las Cruces, New Mexico. The installation is bounded on the south by Fort Bliss, and its eastern edge provides the western boundary of Holloman Air Force Base. U.S. Highways 54 and 380 run close to the eastern and northern edges of the Range, respectively. Interstate 25, a north-south route, runs approximately 13 miles to the west, while U.S. 70 passes through the southern section.

The total land area of White Sands Missile Range is 3,046 square miles. White Sands Missile Range is approximately 90 percent federally controlled, with 70

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percent land withdrawn for military use and 20 percent Dod fee-owned land. The fee lands are primarily concentrated in the cantonment area. The withdrawn lands are fairly evenly distributed throughout the range, interspersed with stateowned land (10 percent). Several large blocks of state lands are concentrated south of the Malpais lava flow, at the northeast edge of the range in the Tularosa Basin, and in the northwest portion of the range in the Jornada del Muerto. The Jornada Experimental Range, White Sands National Monument, and the San Andreas Wildlife Refuge are joint use areas located within the operational confines of White Sands Missile Range.

White Sands Missile Range is within the Basin and Range physiographic province, an area characterized by linear north-trending mountains separated by broad alluvial basins. Effective area is most prevalent at White Sands Missile Range in the central portion of the range in the Tularosa Basin and in the northwest portion of the range in the Jornada del Muerto. These areas are separated by the San Andreas Mountain range and the Oscuro Mountains, which trend north-south, occupying the west and central portion of the range, respectively. Within these mountains are 656 square miles with a slope of 25 percent or greater. Effective area for system operation is further reduced in the

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northeast portion of the range by 70 square miles by the Malpais lava flow and by 704 square miles of dune fields in the south-central range area. A large playa flat situated west of the sand dunes may further reduce effective area due to high flood potential. In total, the sum of the effective area, reduced by policy exclusions, for system operation is 1,613 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of the effective area to 2,144 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: White Sands Missile Range is used for operational test and evaluation of various weapon systems for all branches of the service. The activities that affect assessment of Small ICBM mission compatibility most directly are the ground-to-ground missile tests and tactical air-to-air and air-to-ground gunnery. Areas that are evacuated for the various missile firings often cover extensive portions of the range. These events present scheduling conflicts for most of the range 20 percent of the time or less. Air-to-air and air-to-ground gunnery take place on well-defined locations of the installation, many of which are inaccessible to the Hard Mobile Launcher due to terrain conditions. Areas where live ordnance are

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dropped account for a small percentage of the range and have been excluded.

Mission compatibility issues remain relative to scheduling coordination of range uses, security, protection of range instrumentation sites and archaeological sites and system operabilty in a crowded electromagnetic spectrum.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

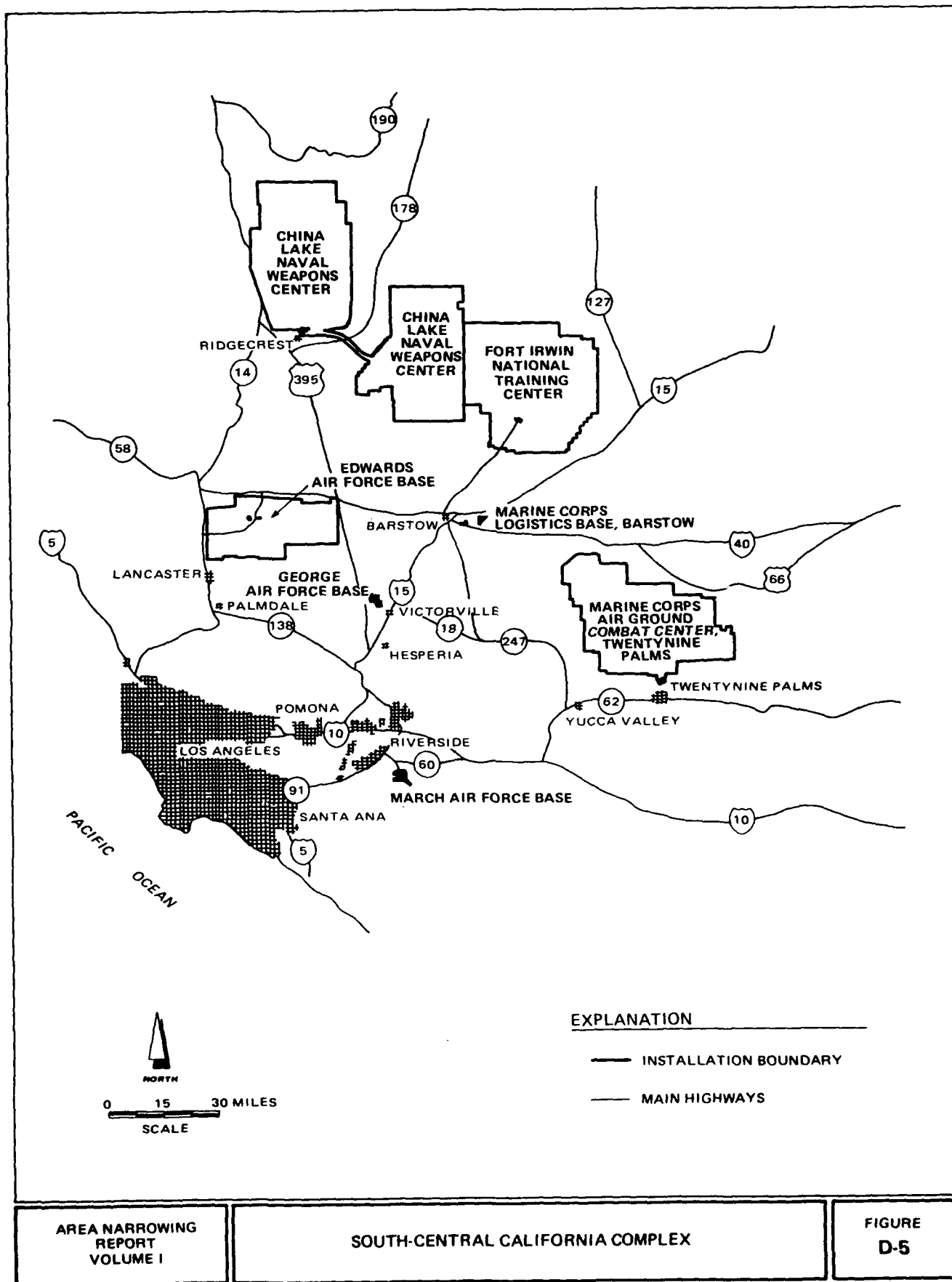
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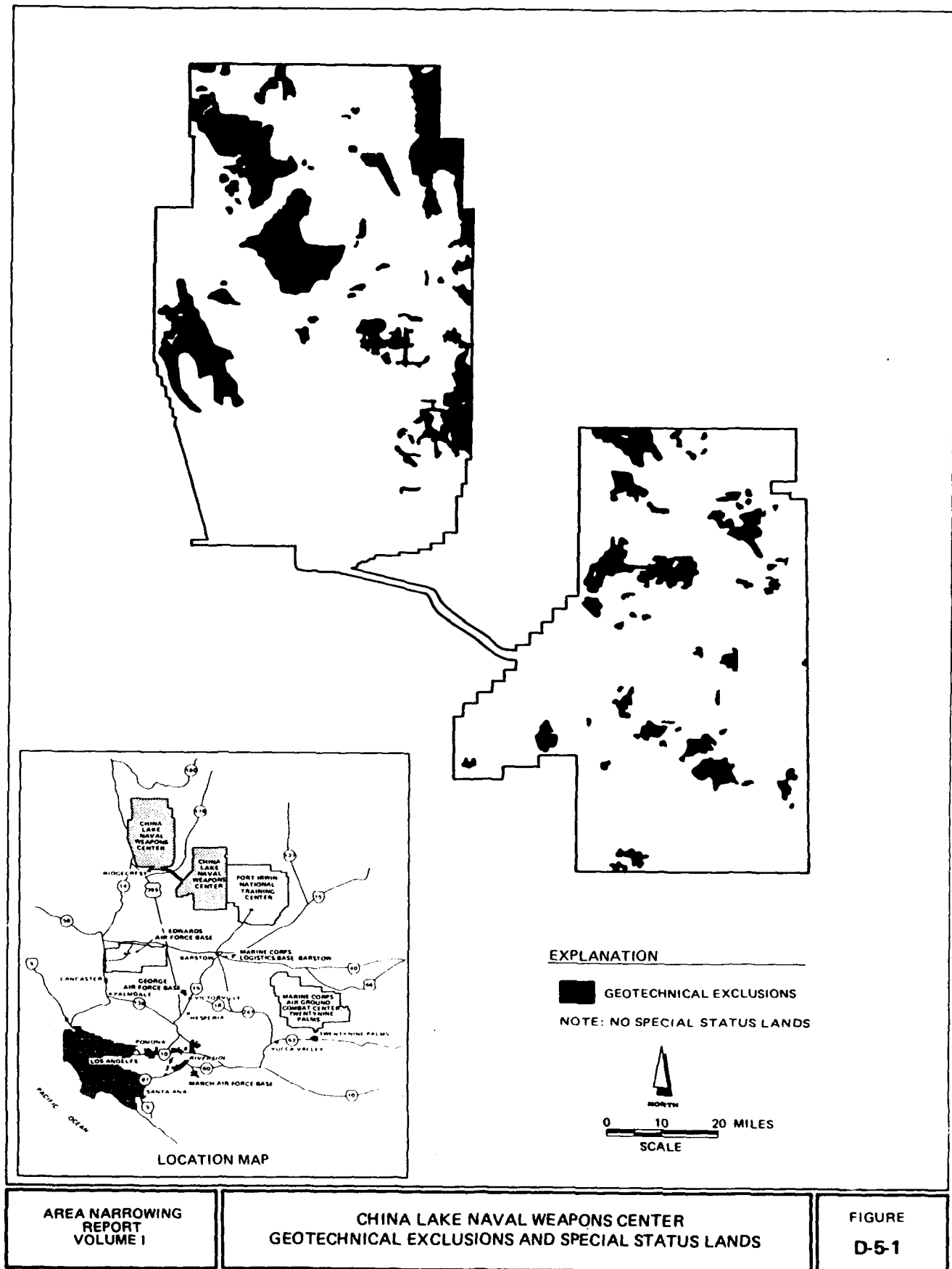


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D-5 South-Central California Complex

The Candidate Deployment Installations within the South-Central California complex are China Lake Naval Weapons Center, Edwards Air Force Base, Fort Irwin National Training Center, and the Marine Corps Air Ground Combat Center, Twentynine Palms (Figure D-5). After application of Evaluative Criteria, all these installations remain for further study; however, no determination is made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.



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D-5.1 China Lake Naval Weapons Center, California

China Lake Naval Weapons Center (NWC) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-5-1), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area may be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: China Lake NWC, a Naval test complex, is situated approximately 25 miles west of Death Valley National Monument, California. The Center is composed of two separate ranges, China Lake North and Mojave B, connected by a Department of Defense owned road; the Mojave B Range is contiguous with the western boundary of Fort Irwin, and China Lake North is about 10 miles to the northwest. U.S. Highway 395 runs along the western edge of the northwestern range, while State Route 178 passes between the two ranges. The community of Ridgecrest abuts the southern border of China Lake North; several smaller communities also ring the range.

The installation encompasses a total of 1,714 square miles. China Lake NWC is almost entirely federally

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owned, comprising land withdrawn for military use (90 percent) and fee-owned land (10 percent). Fee acquired lands are mostly located in the Indian Wells Valley and southwest corner of the China Lake Range Complex. Three cultural resource sites listed in the National Register are located within China Lake NWC.

China Lake NWC is located within the Mojave Desert section of the Basin and Range physiographic province. The area is characterized by mountain ranges separated by alluvial basins of various sizes. By far, the most extensive effective area is the Indian Wells Valley north of the cantonment area. Other, smaller valleys of effective area include Etcharren Valley and Darwin Wash at the north end of the mainside range area, and Long, Pilot Knob, and Superior valleys in the Randsburg Wash and Mojave B Range. These pockets of effective area are divided by mountain ranges with moderate to high relief. A total of 400 square miles of mountains with a slope of 25 percent or greater has been identified. Blocky lava flows located on the north end of Indian Wells Valley reduce the on-base effective area by 155 square miles. In many areas, these rock outcroppings also severely restrict the access between effective areas. The combination of these geotechnical factors, excluding areas that have other reduction factors, reduces the potential effective area for

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system operation to 1,187 square miles. Several small playas, such as China Lake playa at the north end of the cantonment area, may also reduce the effective area due to their high flood potential and fine-grained soil type that are not suitable to all-weather mobility. Consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of the effective area to approximately 1,249 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: Large areas of China Lake North are designated as potentially hazardous due to overhead air-to-ground weapon delivery and ground-to-ground artillery firing. These areas may be available to Hard Mobile Launcher dispersal only during periods of increased tensions. The remainder of this complex presents scheduling coordination requirements approximately 70 percent of the time. The terrain is rugged over the northern sector of the complex, where more mission compatible activities exist, and could hinder Hard Mobile Launcher movement. Existing road networks only partially mitigate this problem.

The Mojave B Range could offer more mission compatible area. Several inert targets, their associated safety zones, and live fire-artillery with safety fans occupy

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part of the area; however, the range appears to offer substantial opportunities for deployment in the effective area between the mountain ranges. The proximity of this potential mission compatible area on the Mojave B Range to the adjacent Fort Irwin National Training Center could result in greater flexibility for deployment than either Fort Irwin or the Mojave B Range could offer individually.

Mission compatibility issues remain relative to safety, scheduling, the electromagnetic environment, and geothermal energy production.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

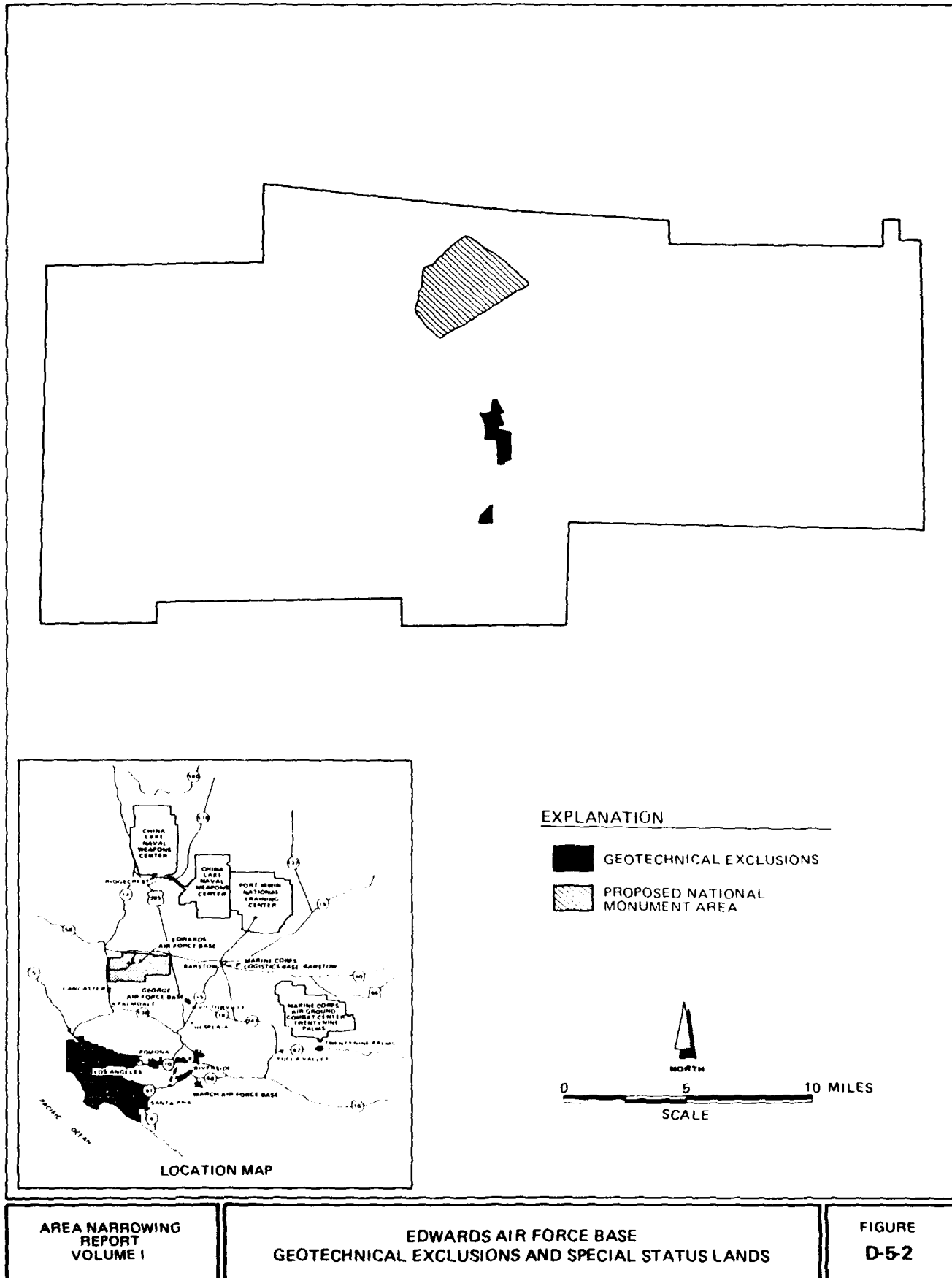
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1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.



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D-5.2 Edwards Air Force Base, California

Edwards Air Force Base (AFB) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-5-2), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area may be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: Edwards AFB is located about 70 road miles from the northern margin of the Los Angeles metropolitan area, between State Highway 58 on the north, U.S. Highway 395 on the east, State Route 14 on the west, and latitude 34 degrees, 45 minutes on the south. Several communities border the base; these include Rosamond on the west boundary and Boron on the north. Lancaster lies about 27 road miles to the south.

The total land area of Edwards AFB is 470 square miles. Edwards AFB consists of approximately 72 percent fee-owned land; the remainder is land withdrawn for military use. All of the land is dedicated for general military use except 2 square miles, which are administered by the National Aeronautics and Space



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Administration and Jet Propulsion Laboratory for operational facilities, research, and testing. Rogers Dry Lake has been nominated by the National Park Service as a National Historic Landmark and is currently used by the National Aeronautics and Space Administration as a Space Shuttle landing strip. Two significant ecological areas designated by Los Angeles County are located on the base.

Edwards AFB is located in the west-central portion of the Mojave Desert. The base terrain is characterized by generally steep, isolated bedrock hills and mountains surrounded by gently sloping, alluvial fans, which merge in valley centers to form flat basin floors on which the Rogers, Rosamond, and Buckhorn playas have formed. These extensive playas in the central and south western portions of the base constitute approximately 63 square miles of base land that are seasonally impassible due to surface flooding and/or damp, unsuitable soils. Approximately 18 to 20 square miles of base land have slopes greater than 25 percent, generally limited to isolated rock outcrops and hilly ridges on the eastern and western portions of the base. Sand dunes located adjacent to Rogers Dry Lake, Rosamond Dry Lake, and Buckhorn Lake encompass approximately 15 square miles. These factors, together with policy exclusions, reduce the potential effective

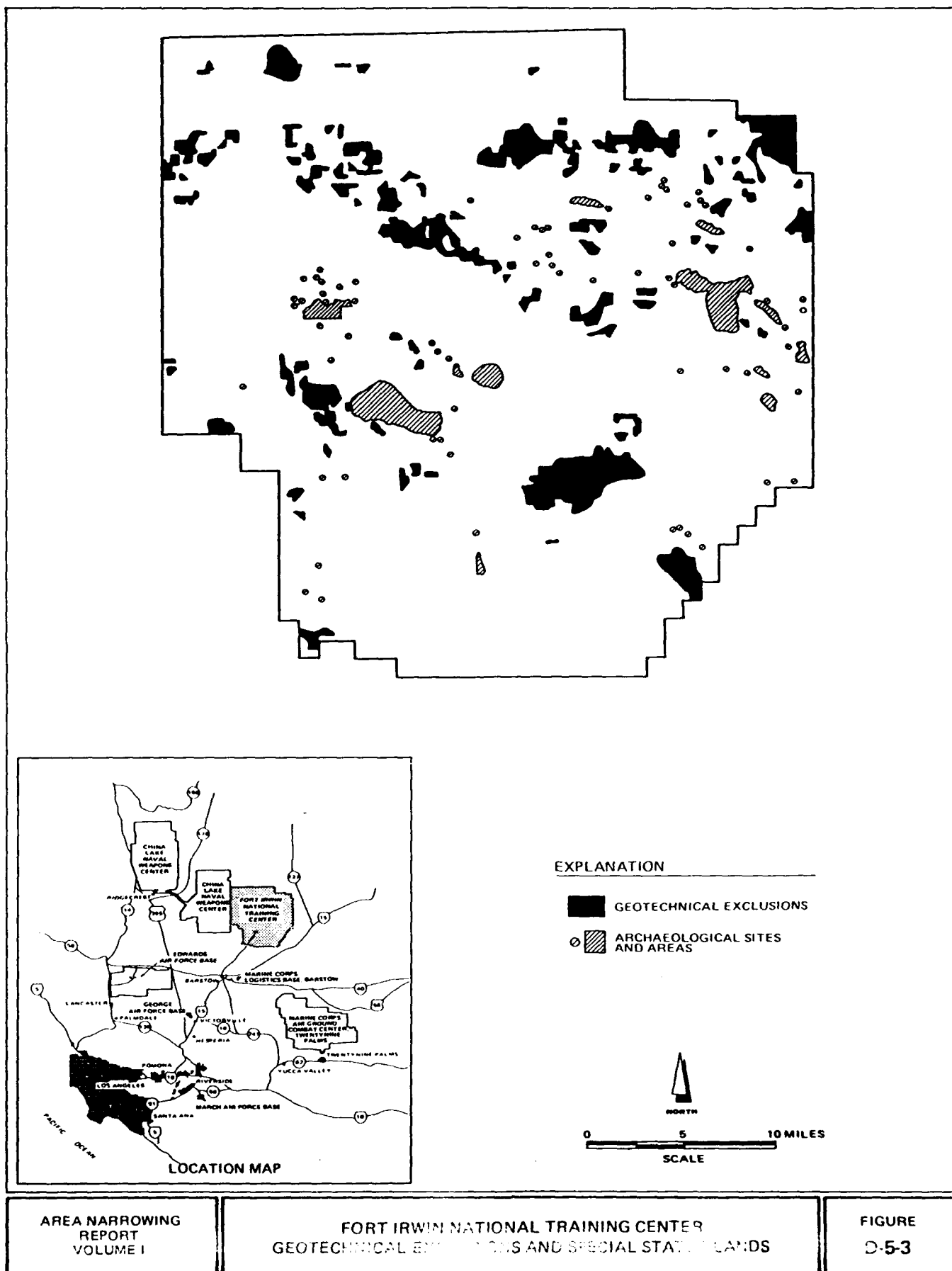
area for system operation to 435 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of the effective area to approximately 460 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: Edwards AFB could potentially provide a third of its area and most of its perimeter area as unconstrained random movement area for the Hard Mobile Launcher mission. The largest mission compatible area is on the western end of the base. The central portion of the base is quite restricted due to the cantonment area and the extensive network of runways on the Rogers Dry Lake. The eastern part of the base is predominantly a temporary avoidance area, and may be suitable for dispersal during periods of increased tensions.

Mission compatibility issues remain relative to command, control and communication effects; future test mission expansion; and security.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.



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D-5.3 Fort Irwin National Training Center, California  
Fort Irwin National Training Center (NTC) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-5-3), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area may be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: Fort Irwin NTC is located in the Mojave Desert, 34 road miles northeast of Barstow, California, and is operated by the Army. Its western boundary is China Lake's Mojave B Range; 2 miles north of the Center's boundary is Death Valley National Monument; to the south is privately owned land; and to the east is Bureau of Land Management land. Interstate 15 and State Highway 127 skirt the eastern and southern boundaries of the base.

The total land area of Fort Irwin NTC is 1,062 square miles. Fort Irwin NTC comprises approximately 97 percent land withdrawn for military use and 3 percent state-owned land. State land is distributed throughout the base in school blocks (sections 16 and 36 in each

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township). The National Aeronautics and Space Administration has been granted 67 square miles along the western boundary for use as the Goldstone Communications Complex. The base has approximately 300 archaeological and historical sites, of varying size, complexity, and significance located throughout the installation. Of these, 29 sites are currently subject to protective measures.

Fort Irwin NTC is located in the Mojave Desert portion of the Basin and Range physiographic province. The terrain on the installation is characterized by broad, gently sloping alluvial valleys separated by generally northwest-trending linear mountain ranges. Mountainous areas have slopes generally greater than 25 percent and occur throughout the installation, constituting 143 square miles of area. These mountain ranges, including the Granite, Avawatz, and Tiefort Mountains, generally tend to separate effective land areas (alluvial valleys) into isolated units with interconnecting routes between effective areas generally only around the ends of the mountain ranges. Extremely rough and impassible lava flows, on which the surface gradient is less than 25 percent, cover an additional 6 square miles, primarily in the southwest and southeast portions of the installation. Geotechnical factors combine to reduce the effective area for system

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operation to 912 square miles. In addition, numerous central-valley playas, such as Bicycle, Nelson, and Leach Lakes, are subject to inundation after periods of heavy precipitation. Playa surfaces are composed of silty and sandy clays that are very hard and easily traversed when dry, but when wet are soft and untrafficable. The base contains an extensive road network that includes paved, improved, and unimproved roads, and numerous tank maneuver trails that provide generally good access to most of the effective area. Consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of effective area to 918 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: Fort Irwin NTC is the only Army installation that affords opportunity needed to train heavy maneuver forces realistically in a free play environment. Approximately two-thirds of Fort Irwin NTC is heavily used most of the year for mechanized unit engagement activities using sophisticated simulation and scoring systems. This area could present difficult scheduling coordination requirements. The northern area of Fort Irwin is situated in difficult terrain that is extensively used for mission-incompatible, live, air-to-ground deliveries. Use of mission compatible area in the northeast portion

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of the base would necessitate the construction of connecting roads through the maneuvering areas. The western portion of Fort Irwin, adjacent to China Lake Naval Weapons Center's Mojave B Range, is occupied by the Goldstone Deep Space Communications Center. This area may be mission-compatible; however, communication frequency coordination, scheduling coordination, and new road construction would be required.

Mission compatibility issues remain relative to mobilization during prolonged periods of increased tension, electromagnetic interference, safety, security, unexploded ordnance, and command structure.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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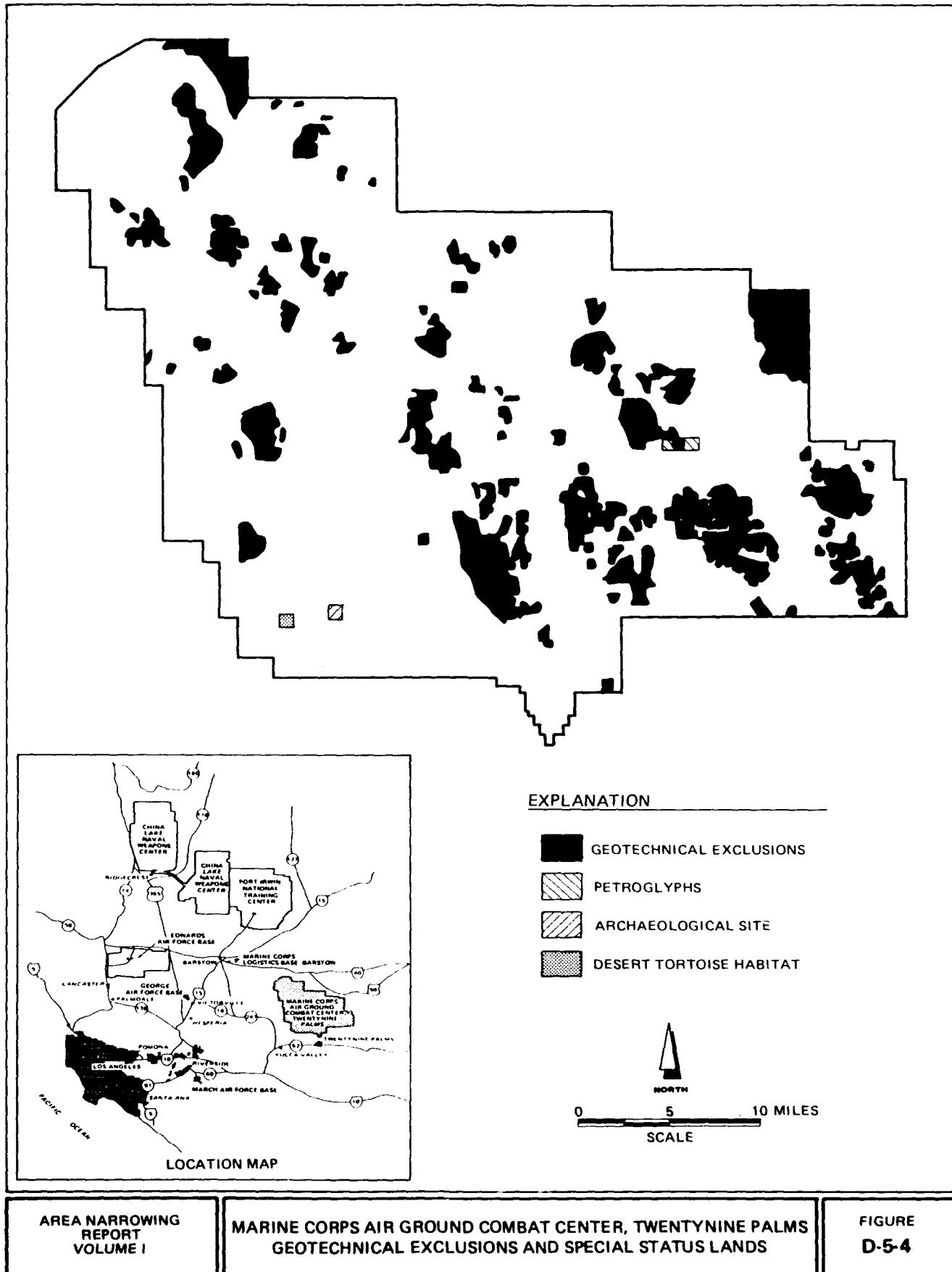
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D-5.4 Marine Corps Air Ground Combat Center, Twentynine Palms, California

Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-5-4), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area may be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: MCAGCC is located 30 miles southeast of Fort Irwin National Training Center and 10 miles north of the Joshua Tree National Monument in California. The communities of Twentynine Palms, Joshua Tree, and Landers are located along the southern border of the Center, while the remainder of the installation is predominantly surrounded by Bureau of Land Management lands. Interstate 40 parallels the northern edge of the Center, while State Highways 247 and 62 run within 10 miles of the southwest and southern borders, respectively.

The total land area of MCAGCC is 932 square miles. Approximately 21 percent of the land is fee owned by the Department of the Navy. Additionally, 77 percent

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of the area is Bureau of Land Management withdrawn land for exclusive use by the Marine Corps. Less than 1 percent is leased from the County of San Bernardino. Fee-owned land is concentrated around Mainside, the main cantonment area.

Three square miles within the Lava Training Area provide for protection of four major panels with petroglyphs, pictographs, prehistoric Indian drawings, and carving in lava rock. An archaeological site at Surprise Springs, a Desert Tortoise preserve, and the center's water well field constitute a 20-square-mile off-limits area in the Sandhill Training Area.

MCAGCC is located within the Mojave Desert section of the Basin and Range physiographic province. The range is dominated by northwest trending mountain ranges of high relief and intervening alluvial valleys with interior drainage. Effective area is most prevalent in the valley areas along the southwest and northeast boundaries of the Combat Center. A total area of approximately 153 square miles has slopes greater than 25 percent. Blocky lava flows from Amboy Crater and Pisgah Crater and a lava flow northeast of Bullion Mountain reduce effective area by approximately 35 square miles. Additionally, approximately 19 square miles of sand dunes and sheet sands located along the

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west side of Hidalgo Mountain further restrict the effective area present on MCAGCC. Geotechnical factors combine to reduce the effective area for system operation to 724 square miles. Emerson Dry Lake and a portion of Bristol Dry Lake may also reduce effective area due to their high flood potential and unsuitable soils. The Combat Center has a moderately well-developed network of infrequently bladed dirt roads; however, a high potential for flash flooding in the area has locally affected this road network during storms. Consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of the effective area to approximately 726 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: MCAGCC is the only installation that provides acreage necessary to host a variety of live fire exercises. The Combat Center property is divided for operational purposes into 22 separate training areas. Within the training areas there are 28 separate ranges, each offering different training opportunities.

A major portion of the land area at MCAGCC is used for live fire; however, the Combat Center has a mandated 1,000-meter, no ordnance impact buffer zone around the

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perimeter. This buffer zone could provide sufficient potential random movement area and proximity to off-base areas for dispersal during tactical warning; however, there is no guarantee that live fire will not stray into the safety buffer zone. Other areas with compatible mission and suitable potential random movement area may be available in the southwestern section of the Combat Center.

Most of the training ranges on the base are potentially hazardous avoidance areas arising from the use of live overhead artillery fire and air-to-ground delivery. Use of these areas during command dispersal or dash on tactical warning may be limited to on-road movement in order to avoid unexploded ordnance.

Mission compatibility issues remain relative to overflight with ordnance-laden aircraft, security, scheduling, and troop mobilization during periods of prolonged increased tension.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

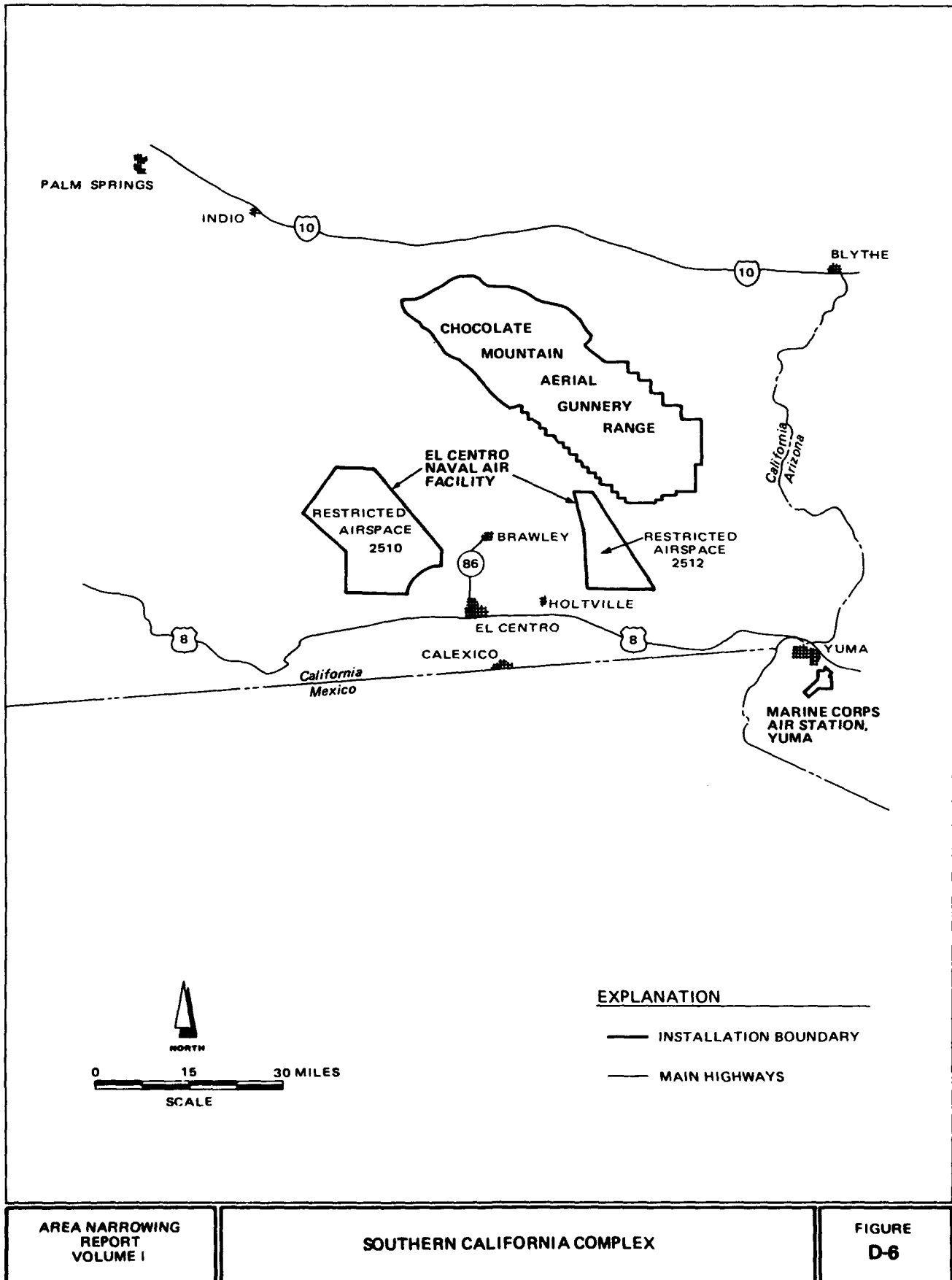
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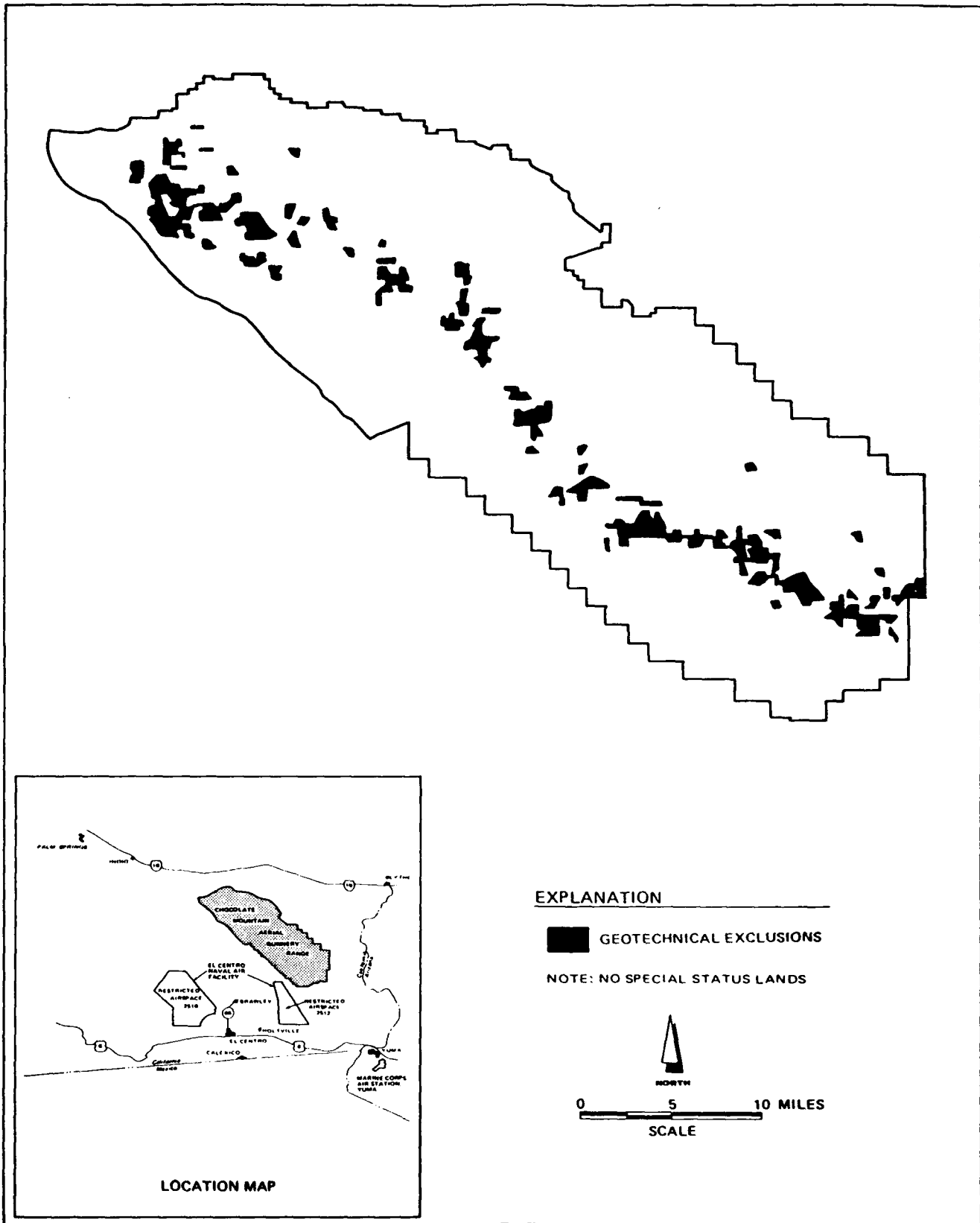
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D-6 Southern California Complex

The Candidate Deployment Installations within the Southern California Complex are Chocolate Mountain Aerial Gunnery Range and El Centro Naval Air Facility (Figure D-6). After application of Evaluative Criteria, this complex was eliminated because it offers only limited random movement area, accessibility to the deployment area is constrained, and the distances from the Main Operating Base to the deployment areas are excessive.



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AREA NARROWING  
REPORT  
VOLUME I

CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE  
GEOTECHNICAL EXCLUSIONS AND SPECIAL STATUS LANDS

FIGURE  
D-6-1

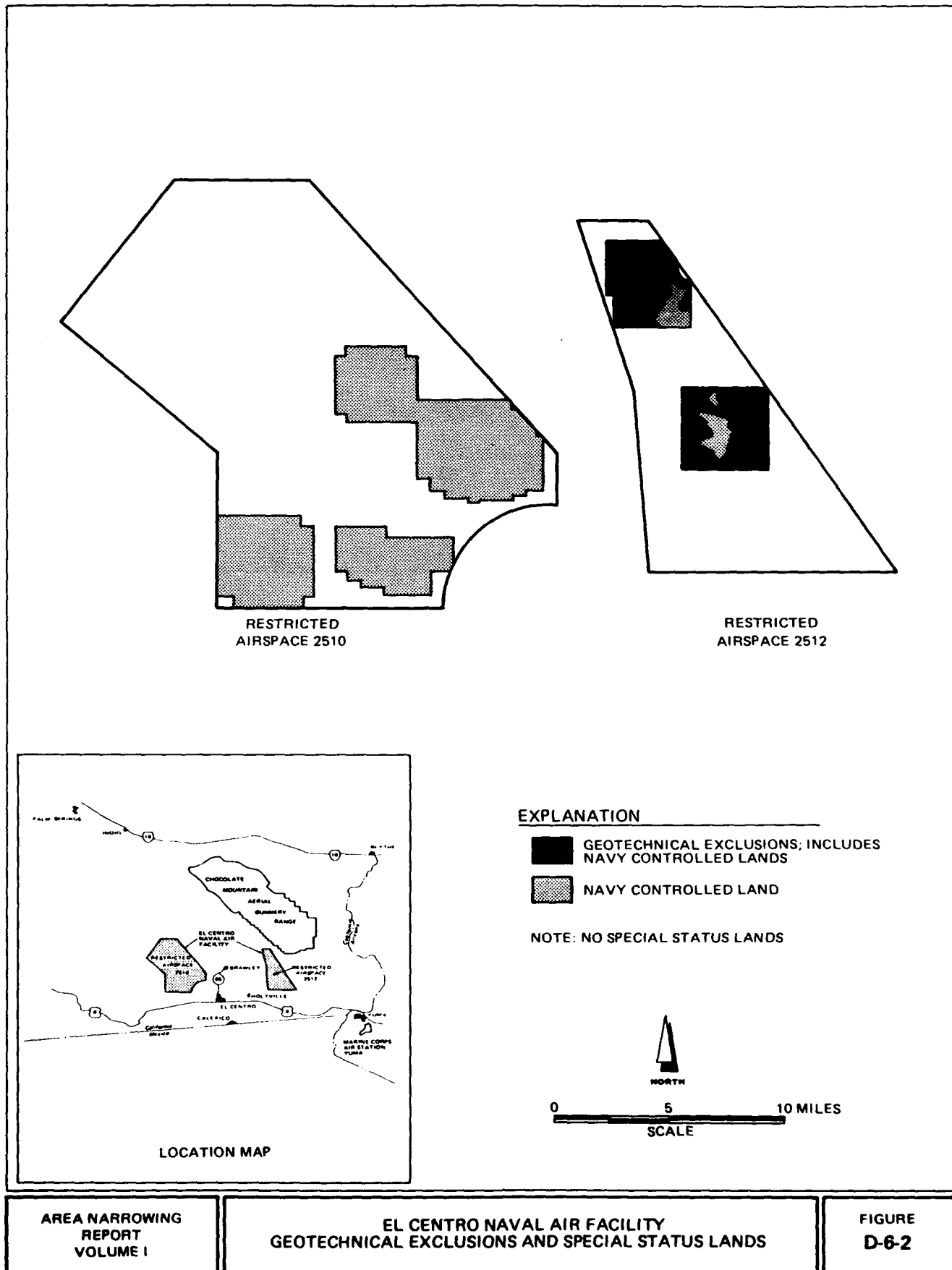
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D-6.1 Chocolate Mountain Aerial Gunnery Range,  
California

Because the Southern California Complex, as a whole, performed poorly, Chocolate Mountain Aerial Gunnery Range was eliminated from further study as a Candidate Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-6-1), and the identification of current mission land use with regard to Small ICBM operations, indicate that there remains insufficient deployment area available on this installation to warrant further investigation. See Section D-1.1 for a more detailed discussion of this installation.

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D-6.2 El Centro Naval Air Facility, California

Because the Southern California Complex, as a whole, performed poorly, El Centro Naval Air Facility (NAF) was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-6-2), and the identification of current mission land use with regard to Small ICBM operations, indicate that there remains insufficient deployment area available on this installation to warrant further investigation.

Description: Restricted Airspaces R-2510 and R-2512, separated by 25 miles, are located about 15 miles north of the U.S.-Mexico border, in southeastern California. El Centro lies about 10 radial miles from Range R-2510 and 26 radial miles from Range R-2512, with Interstate 8 running a few miles to the south. About 10 miles to the west of R-2510 is the Anza-Borrego Desert State Park. These ranges contain noncontiguous target zones with public access lands between targets.

The targets encompass a total of 86 square miles of land. The range areas that contain the target areas are composed of 8 square miles of fee-owned land; the remaining 78 square miles are Bureau of Land Management withdrawn land. The land under Bureau of Land

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Management agreement is presently being renegotiated, with the intent of retaining the current acreage in use. The Navy also has a joint-use agreement with the Bureau of Land Management for an additional 150 square miles that is used for armed overflight areas by the Navy and off-road vehicle use by the public.

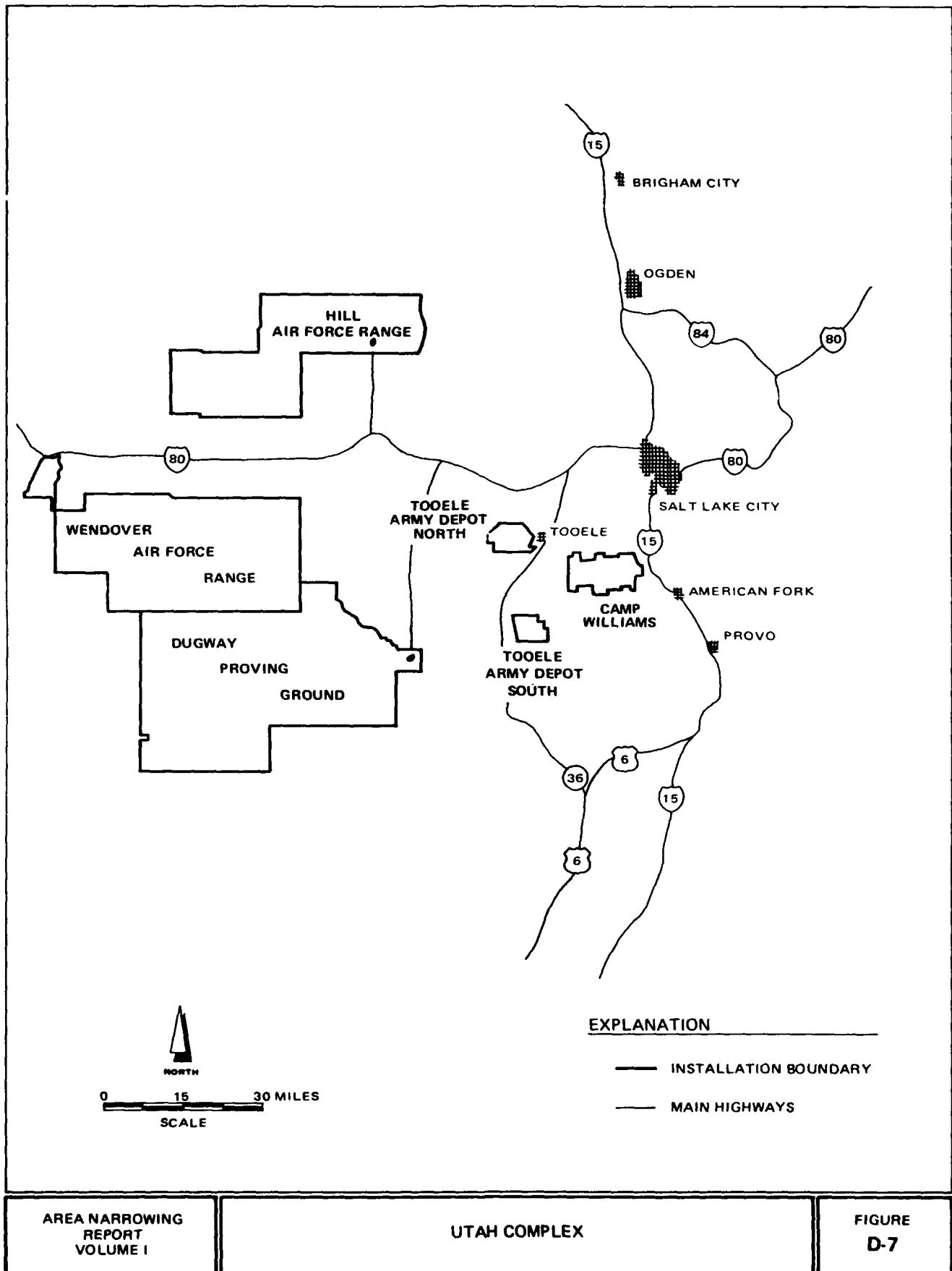
The El Centro NAF ranges are located on both the east and west sides of the Salton Trough, a northwest-trending, flat-floored structural basin bordered on each side by mountain ranges. Located south of the Salton Sea, the range area to the west (2510) is composed of coarse-grained alluvial and fine-grained ancient lake deposits. The range to the east (2512) is composed of wind-blown sands overlying fine-grained ancient lake deposits. The majority of terrain in Target 68, occupying 14 square miles in Range 2512, is untrafficable; closely spaced, stabilized sand dunes reduce the effective area to less than 2 square miles. The other target (95) in Range 2512 contains only 10 square miles, for a total effective area of 12 square miles. Noncontiguous targets in Range 2510, totaling 60 square miles, have geotechnical factors that reduce effective area to 58 square miles. The road network serving all these target areas is poorly developed. Together the two ranges produce a total effective area of 70 square miles.

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Mission Compatibility Issues/Accessibility of

Deployment Area: The El Centro NAF includes land areas within the boundaries of Restricted Airspaces 2510 and 2512. Most of the area within the boundaries is either Bureau of Land Management land or land under a joint use agreement between the Bureau of Land Management and the Navy. In R-2510 only three target areas and a drop zone are under exclusive control of the Navy. The drop zone has insufficient accessible area to support dispersal of a Hard Mobile Launcher during periods of increased tensions. The target areas total only approximately 44 square miles and are frequently used for inert weapons delivery and practice strafing. Due to the limited area and the mission incompatibilities these target areas should be eliminated from further consideration for Small ICBM Hard Mobile Launcher deployment at this time. Within the boundaries of Restricted Airspace R-2512 both target areas have insufficient contiguous effective area required for dispersal of the Hard Mobile Launcher during periods of high tension. Accordingly, R-2512 should be eliminated from further consideration.

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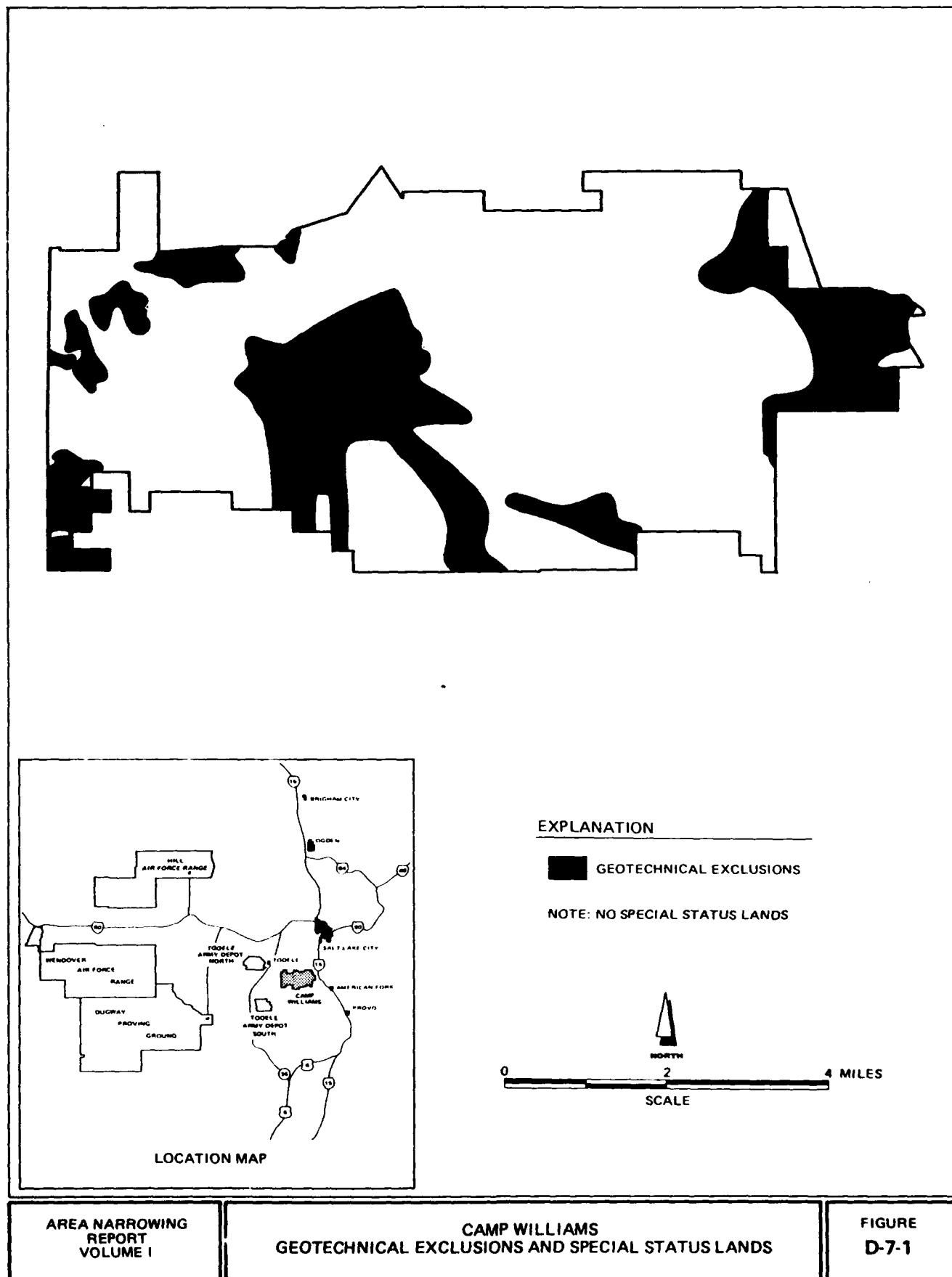
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D-7 Utah Complex

The Candidate Deployment Installations within the Utah Complex are Camp Williams, Dugway Proving Ground, Hill Air Force Range, Toole Army Depot North, Toole Army Depot South, and Wendover Air Force Range (Figure D-7). After application of Evaluative Criteria, this complex was eliminated because the potentially available effective area on all the deployment areas falls short of providing the required command dispersal area for the minimum number of launchers and far short of providing the desired random movement area. This, combined with the fragmented nature of the deployment areas (which are widely dispersed, support few launchers, and are relatively inaccessible), led to the elimination of the entire complex.



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D-7.1 Camp Williams, Utah

Because the Utah Complex, as a whole, performed poorly, Camp Williams was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-7-1), and the identification of current mission land use with regard to Small ICBM operations, indicate that there remains insufficient deployment area available on this installation to warrant further investigation. The potentially available effective area, in conjunction with that on other deployment areas within this complex, falls short of providing the required command dispersal area for the minimum number of launchers and far short of providing the desired random movement area. This, combined with the fragmented nature of the deployment areas (which are widely dispersed, support few launchers, and are relatively inaccessible), led to the elimination of the installation from further consideration.

Description: Camp Williams, operated by the National Guard, is approximately 25 miles south of Salt Lake City, Utah, and about 15 miles east of the Tooele Army Depot North. Its total land area is 36 square miles. Great Salt Lake is situated about 20 miles to the north, while one part of Wasatch National Forest is

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located a few miles to the east, separated by U.S. Highway 89. The cities of Orem and Provo are less than 15 miles southeast of the installation.

Camp Williams comprises approximately 68 percent land withdrawn for military use, 10 percent land owned in fee, 10 percent privately owned land, and 12 percent state-owned lands. Fee-owned lands are concentrated in and around the base cantonment area. State and privately owned lands are generally distributed throughout the withdrawn land, frequently in land plots of 40 acres or less.

Camp Williams is located along the eastern edge of the Basin and Range physiographic province, just west of the Wasatch Mountain front. Camp Williams is located almost entirely within the Traverse Mountains, but also includes a small portion of the southeastern Oquirrh Mountains. These bedrock areas are encircled by a narrow band of alluvial deposits, which grade into sandy and gravelly terraces formed by ancient Lake Bonneville. About 30 square miles of the Traverse Mountains have slopes in excess of 25 percent. This area of excessive slope, which covers about 83 percent of the installation, reduces the potentially effective area for system operation to 6 square miles. No other geotechnical factors reduce the on-base effective area.

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Access to the effective area is generally adequate, via unimproved and improved roads. Consideration of installation roads and trails for movement of the Hard Mobile Launchers results in an increase of the effective area to 28 square miles.

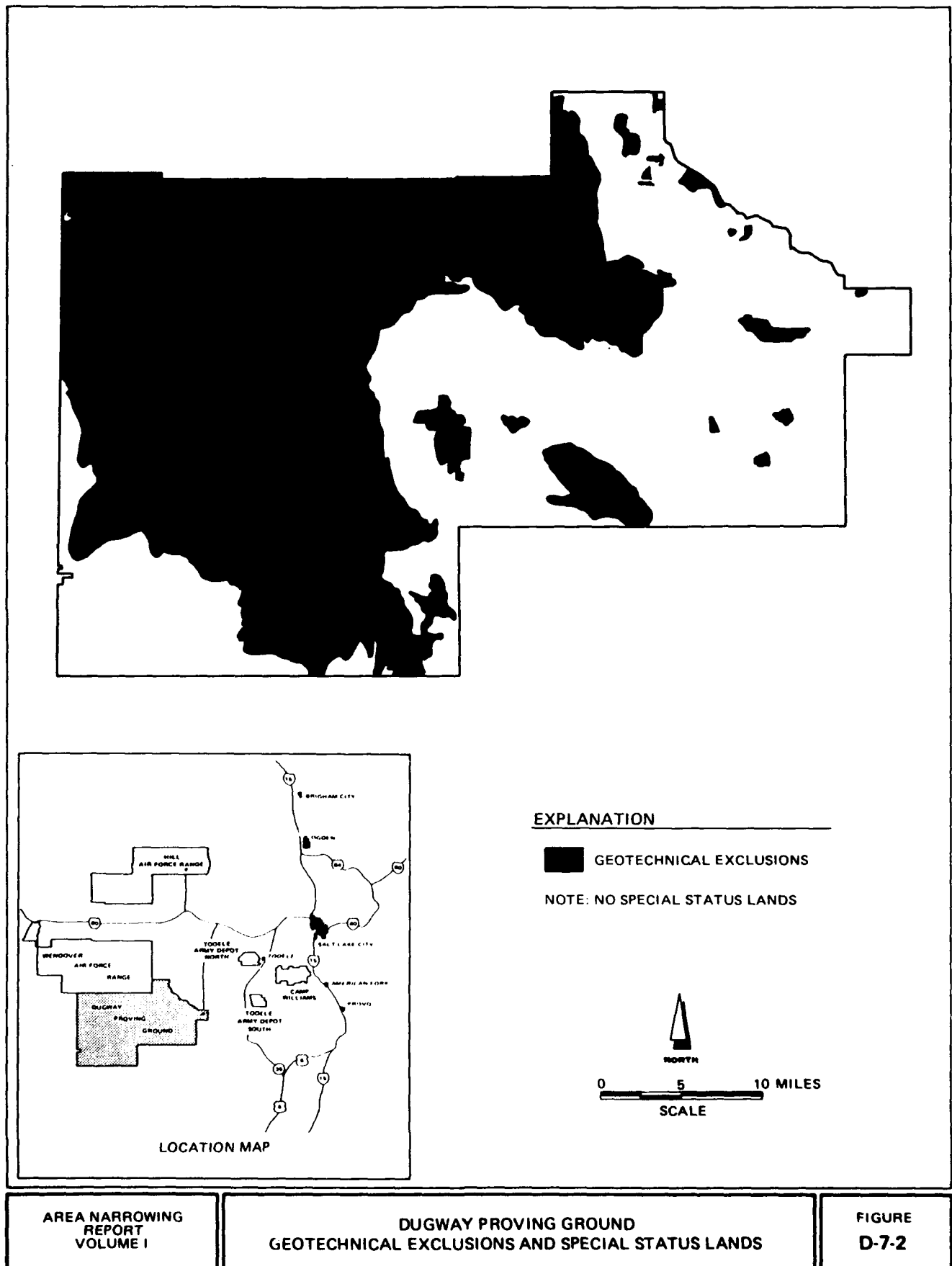
Mission Compatibility Issues/Accessibility of

Deployment Area: The primary activity at Camp Williams is artillery and small arms range firing.

Approximately 20 percent of the very limited effective area is incompatible for random movement of the Hard Mobile Launcher. The small remaining scheduling constrained area could be sufficient for only a very few Hard Mobile Launchers.

The small deployment areas on base could be accessible using existing roads and/or roads to be developed.

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D-7.2 Dugway Proving Ground, Utah

Because the Utah Complex, as a whole, performed poorly, Dugway Proving Ground (PG) was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-7-2), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area is potentially available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues. A significant portion of the potential deployment area is accessible over direct, on-installation routes. The potentially available effective area, in conjunction with that on other deployment areas within the complex, falls short of providing the required command dispersal area for the minimum number of launchers and far short of providing the desired random movement area. This, combined with the fragmented nature of the deployment areas (which are widely dispersed, support few launchers, and are relatively inaccessible), led to the elimination of the installation from further consideration.

Description: Dugway PG, operated by the Army, is contiguous with and south of the Wendover Air Force Range, approximately 87 road miles southwest of Salt

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Lake City, Utah. Ten miles to the northeast lie Skull Valley Indian Reservation and a portion of Wasatch National Forest. Fish Springs National Wildlife Refuge is contiguous with Dugway PG's southern boundary, while the Great Salt Lake Desert covers almost two-thirds of the installation. Surrounding roads are mostly unpaved, in varying conditions.

The total land area of Dugway PG is 1,246 square miles. Land ownership on Dugway PG consists of approximately 98 percent land withdrawn for military use and 2 percent fee-owned land. The fee-owned land is located primarily in the cantonment areas of English Village, Ditto Area, and Baker. Additionally, there are five in-leases totaling over 8 square miles (less than 1 percent), referred to as the southern triangle, which is located in the northeast side of the Dugway Mountain Range, southwest of English Village.

Dugway PG is located along the northeastern edge of the Basin and Range physiographic province. Geographically significant to Dugway PG is Granite Mountain, which trends north through the east-central portion of the range. West of Granite Mountain is the Great Salt Lake Desert, characterized by extremely flat topography, clay soils, and little to no vegetation. Approximately one-half of the total range area (about 648 square

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miles) is composed of clayey playa deposits typical of the Great Salt Lake Desert. These fine-grained playa soils, coupled with the high ground-water table, create extremely poor mobility conditions. Effective area is predominantly situated east of the Granite Mountains on fine-grained soils associated with ancient Lake Bonneville. Poor soil conditions are somewhat mitigated in the Government Valley area by numerous well-maintained gravel and bituminous roads. Effective area is reduced about 42 square miles by slopes of 25 percent or greater in the Granite Cedar and Dugway Mountains. Sand dunes are also a significant feature in the east-central portion of the installation, occupying up to 56 square miles; however, the dunes are generally of low relief and might be mitigated easily by new road construction. In the aggregate, potentially effective area for system operation is 511 square miles of the 1,246 total square miles.

Mission Compatibility Issues/Accessibility to

Deployment Area: Dugway PG is a major test range for testing chemical warfare and biological defensive systems, incendiary devices, smoke/obscurants, and conventional munitions.. Portions of the Proving Ground are incompatible for any Hard Mobile Launcher movement. However, two-thirds of the range could be available for Hard Mobile Launcher random movement on a scheduled basis approximately 80 percent of the time.



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Access to portions of the mission compatible deployment area would require long, indirect, off-installation transit. However, most of the effective area is accessible using direct on-installation routes.

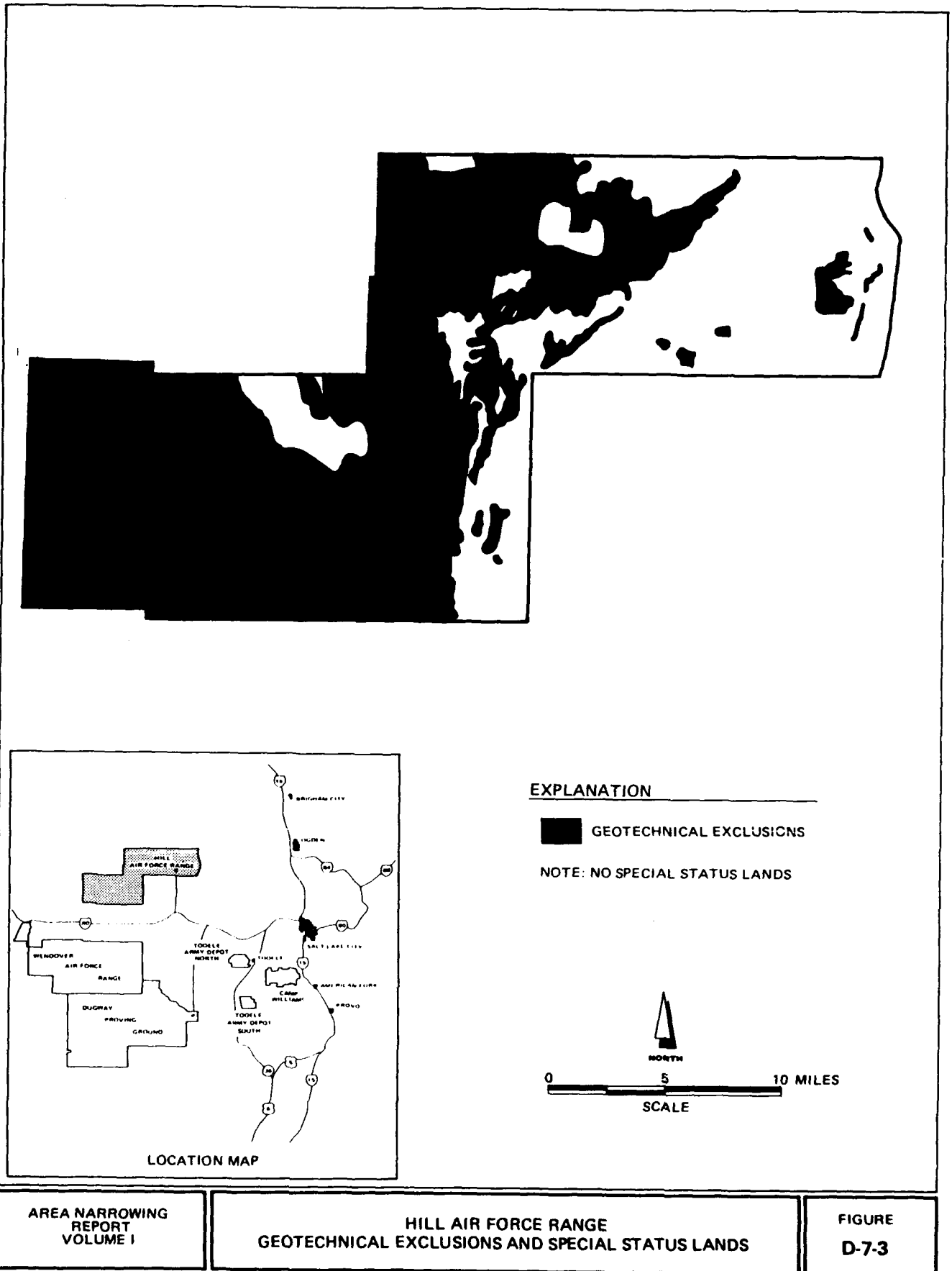
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D-7.3 Hill Air Force Range, Utah

Because the Utah Complex, as a whole, performed poorly, Hill Air Force Range (AFR) was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-7-3), and the identification of current mission land use with regard to Small ICBM operations, indicate that there remains insufficient deployment area available on this installation to warrant further investigation. The potentially available effective area, in conjunction with that on other deployment areas within this complex, falls short of providing the required command dispersal area for the minimum number of launchers and far short of providing the desired random movement area. This, combined with the fragmented nature of the deployment areas (which are widely dispersed, support few launchers, and are relatively inaccessible), led to the elimination of the installation from further consideration.

Description: Hill AFR, also referred to as Restricted Airspace R-6404, is controlled by the 6501 Range Squadron of the 6545th Test Group at Hill Air Force Base, Utah. It is located about 15 miles north of Wendover Air Force Range, Utah. Hill AFR's easternmost border is contiguous with the Great Salt Lake, and the

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majority of the installation is within the Great Salt Lake Desert. Interstate 80 runs parallel to the southern border.

Hill AFR is the northernmost range of the Utah Test and Training Range (UTTR) Complex. UTTR is operationally under the control of the 6545th Test Group at Hill AFB, Utah. Other components of the UTTR are the Wendover Air Force Range and Restricted Airspace R-6407, which overlies the western portion of the Dugway Proving Ground.

The total land area of Hill AFR is 573 square miles. Hill AFR comprises about 95 percent land withdrawn for military use and 5 percent leased state and local land. Leased land consists primarily of a land- and water-rights extension into the Great Salt Lake to prevent curtailment of the range mission.

Hill AFR lies west of the Great Salt Lake in Utah, primarily in the Great Salt Lake Desert, an area identified by flat, undissected, highly alkaline clay soils deposited in ancient Lake Bonneville. The geotechnical factors that greatly decrease effective area on the range include 25 percent grades, surface water, sand dunes, and unsuitable fine-grained soils. About 5 percent of the range has a slope of 25 percent or greater. These areas are located in the Lakeside

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and Grassy mountains on the east side of the range and the Newfoundland Mountains in the north central portion. Surface water, primarily the Great Salt Lake, covers 9 percent of the range. Three percent of the range is covered by sand dunes, generally located in the central range area. Unsuitable soils, consisting of fine-grained lake deposits combined with a near surface ground-water table, occur over about 74 percent of the base. Combined geotechnical factors reduce the effective area to approximately 92 square miles of the original 573 square miles, leaving only narrow strips of alluvial and lake terrace deposits around the mountain ranges. Some effective areas, such as around the Newfoundland Mountains, may be further reduced because they are isolated by unsuitable soils. The base road network is poorly developed and distributed, connecting only the cantonment area with target ranges and storage facilities.

Mission Compatibility Issues/Accessibility of

Deployment Area: Approximately 60 percent of the limited effective area on Hill AFR is used for air-to-ground high explosive impact, inert ordnance delivery, high explosive testing, and other activities incompatible with day-to-day Hard Mobile Launcher deployment; only one-third of this area could become available for command dispersal during periods of increase tension.

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More than one-quarter of the remaining effective area that may be mission compatible is located in areas inaccessible or accessible only over long, off-installation routes.

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D-7.4 Tooele Army Depot North, Utah

Because the Utah Complex, as a whole, performed poorly, Tooele Army Depot (AD) North was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks, and the identification of current mission land use with regard to Small ICBM operations, indicate that, due to current missions, there remains insufficient deployment area available on this installation to warrant further investigation. The potentially available effective area, in conjunction with that other deployment areas within this complex, falls short of providing the required command dispersal area for the minimum number of launchers and far short of providing the desired random movement area. This, combined with the fragmented nature of the deployment areas (which are widely dispersed, support few launchers, and are relatively inaccessible), led to the elimination of the installation from further consideration.

Description: The northern portion of Tooele AD is located 15 miles northwest of Camp Williams and about 35 miles east of the Wendover Air Force Range (see Figure D-7). The Depot is within 5 miles of a portion of Wasatch National Forest to the west and within 15 miles of the Great Salt Lake to the north. State



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routes 138, 112, and 36 encircle the installation, and Interstate 80 is about 5 miles north. Salt Lake City is about 34 road miles to the northeast, and the town of Tooele is adjacent to the depot.

The total land area of Tooele AD North is 39 square miles. The installation area is approximately 89 percent fee-owned land. The remainder of the area consists of land withdrawn for military use, which is interspersed in small parcels throughout the base. A number of easements have been granted on the base for various utility services. There are no state or privately-owned lands on base.

Tooele AD North is located in Tooele Valley, Utah, along the northeastern edge of the Basin and Range physiographic province. Most of the installation is potentially effective area for system operation; buildings and ammunition bunkers reduce this effective area slightly. No geotechnical, policy/legal, or vegetation factors limit the effective area, which is approximately 39 square miles. On-base soils consist of sand and gravel terrace deposits, which have been dissected by several large stream channels that form linear barriers to off-road mobility. Access to all base areas is provided by a well-developed road network.

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Mission Compatibility Issues/Accessibility of

Deployment Area: The primary activities at Tooele AD North are the storage of ammunition and missile stages, performance of ammunition maintenance, and surveillance and demilitarization of ammunition. Approximately 50 percent of the very limited effective area is incompatible for Hard Mobile Launcher random movement. The relatively small remaining mission compatible area could support only a very few Hard Mobile Launchers.

The small deployment areas on base could be accessible using existing roads.

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D-7.5 Tooele Army Depot South, Utah

Because the Utah Complex, as a whole, performed poorly, Tooele Army Depot (AD) South was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks, and the identification of current mission land use with regard to Small ICBM operations, indicate that, due to current missions, there remains insufficient deployment area available on this installation to warrant further investigation. The potentially available effective area, in conjunction with that on other deployment areas within this complex, falls short of providing the required command dispersal area for the minimum number of launchers and far short of providing the desired random movement area. This, combined with the fragmented nature of the deployment areas (which are widely dispersed, support few launchers, and are relatively inaccessible), led to the elimination of the installation from further consideration.

Description: The southern portion of Tooele AD lies approximately 12 miles south of Tooele AD North and 12 miles southwest of Camp Williams (see Figure D-7). State Routes 199 and 36 meet at the northwest corner of the installation, which is about 5 miles east of a part of Wasatch National Forest. The communities of Faust and Vernon are nearby.

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The total land area of Tooele AD South is 30 square miles. Tooele AD South is approximately 77 percent land withdrawn for military use and 23 percent fee-owned land. Fee-owned land is concentrated in the southwest and northeast corners of the depot. Easements have been granted for various utility services; however, there are no state or privately owned lands on base.

Tooele AD South is located in Rush Valley, Utah, along the northeastern edge of the Basin and Range physiographic province. Most of the installation is potentially effective area for system operation; buildings and ammunition bunkers constitute the only effective area reductions. Approximately one-half of the base consists of coarse-grained alluvial fan deposits and gravel terraces and fine-grained lake-bottom deposits. There are no geotechnical, policy/legal, or vegetation factors that limit the effective area on-base. The total effective area of Tooele AD South is approximately 30 square miles. However, mobility may be curtailed in the southwest corner of the base during wet weather. A well-developed network of primarily gravel roads provides access to all of the on-base area.

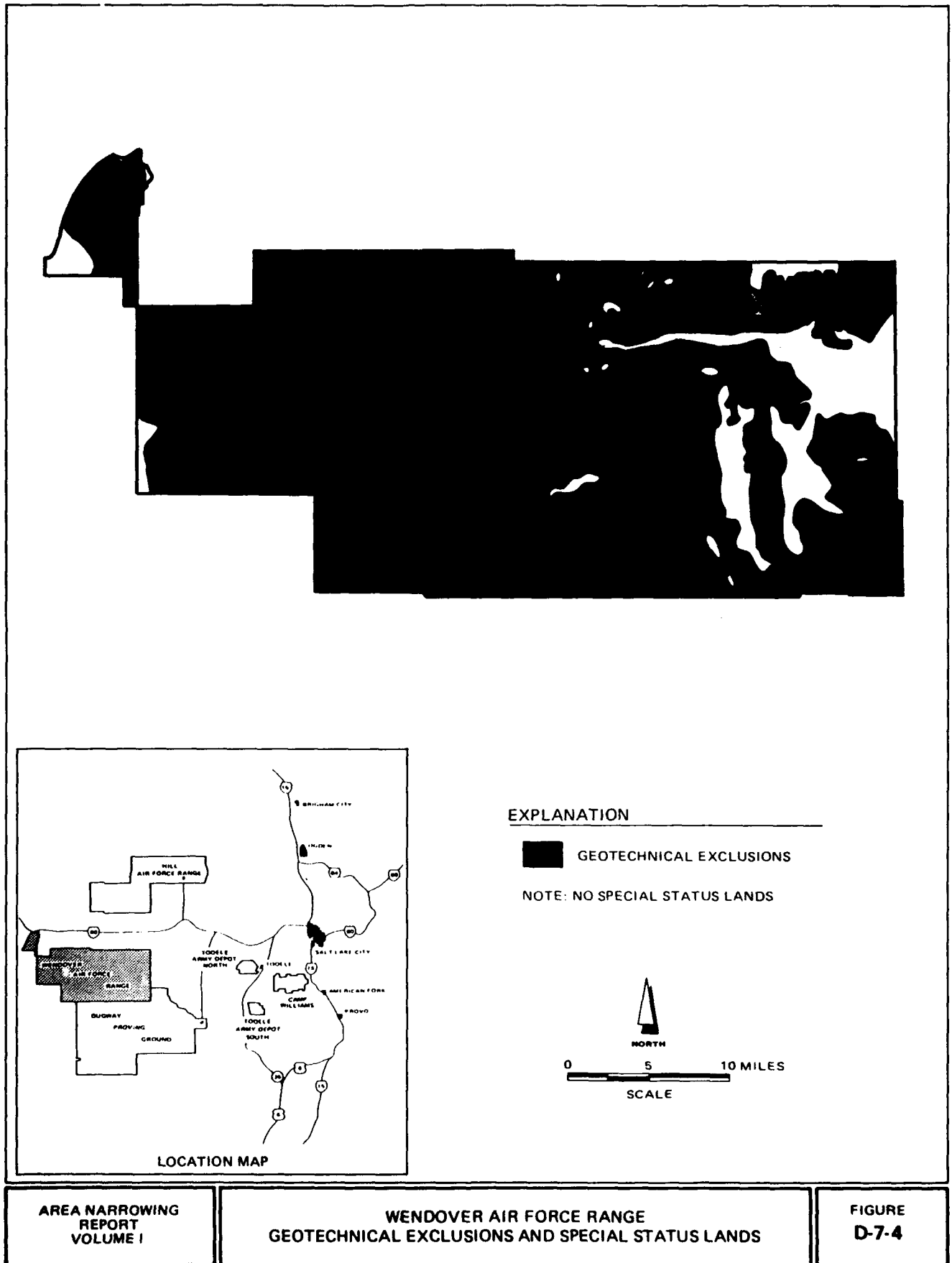
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Mission Compatibility Issues/Accessibility of

Deployment Area: Tooele AD South has as its primary activities the storage, renovation and disposal of toxic munitions. Approximately 30 percent of the very limited effective area is incompatible for day-to-day movement of the Hard Mobile Launcher. The relatively small remaining mission compatible and scheduling constrained area could support only a very few Hard Mobile Launchers.

The small deployment areas on base could be accessible using existing roads.

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D-7.6 Wendover Air Force Range, Utah

Because the Utah Complex, as a whole, performed poorly, Wendover Air Force Range (AFR) was eliminated from further study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-7-4), and the identification of current mission land use with regard to Small ICBM operations, indicate that there remains insufficient deployment area available on this installation to warrant further investigation. The potentially available effective area, in conjunction with that on other deployment areas within this complex, falls short of providing the required command dispersal area for the minimum number of launchers and far short of providing the desired random movement area. This, combined with the fragmented nature of the deployment areas (which are widely dispersed, support few launchers, and are relatively inaccessible), led to the elimination of the installation from further consideration.

Description: Wendover AFR, also referred to as Restricted Airspace R-6406, is under the command of the 6545th Test Group at Hill Air Force Base, Utah. It is located just east of the Utah-Nevada border and is contiguous with the Dugway Proving Ground. The range is situated within the Great Salt Lake Desert, and is



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about 15 miles south of Hill Air Force Range and the Bonneville Salt Flats. Interstate 80 runs parallel to the Range's north border. The community of Wendover, Nevada, is about 5 miles from the installation's northwest corner.

Wendover AFR is the central part of the Utah Test and Training Range (UTTR), operated by the 6545th Test Group at Hill Air Force Base, Utah. The other components of the UTTR are the Hill Air Force Range and Restricted Airspace R-6407, which overlies the western portion of the Dugway Proving Ground.

The total land area of Wendover Air Force Range is 922 square miles. Approximately 97 percent of Wendover AFR consists of land withdrawn for military use. About 3 percent of the range is leased from the state of Utah. Leased land generally consists of square mile sections located in the north-central and western portions of the range.

Wendover AFR lies almost entirely within the Great Salt Lake Desert, which characteristically contains large expanses of flat, fine-grained, high-alkaline soils. Geotechnical factors that decrease effective area on the range include 25 percent grades, surface water, sand dunes, and unsuitable fine-grained soils. Effective area on the range is reduced 11 square miles

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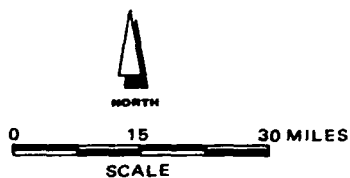
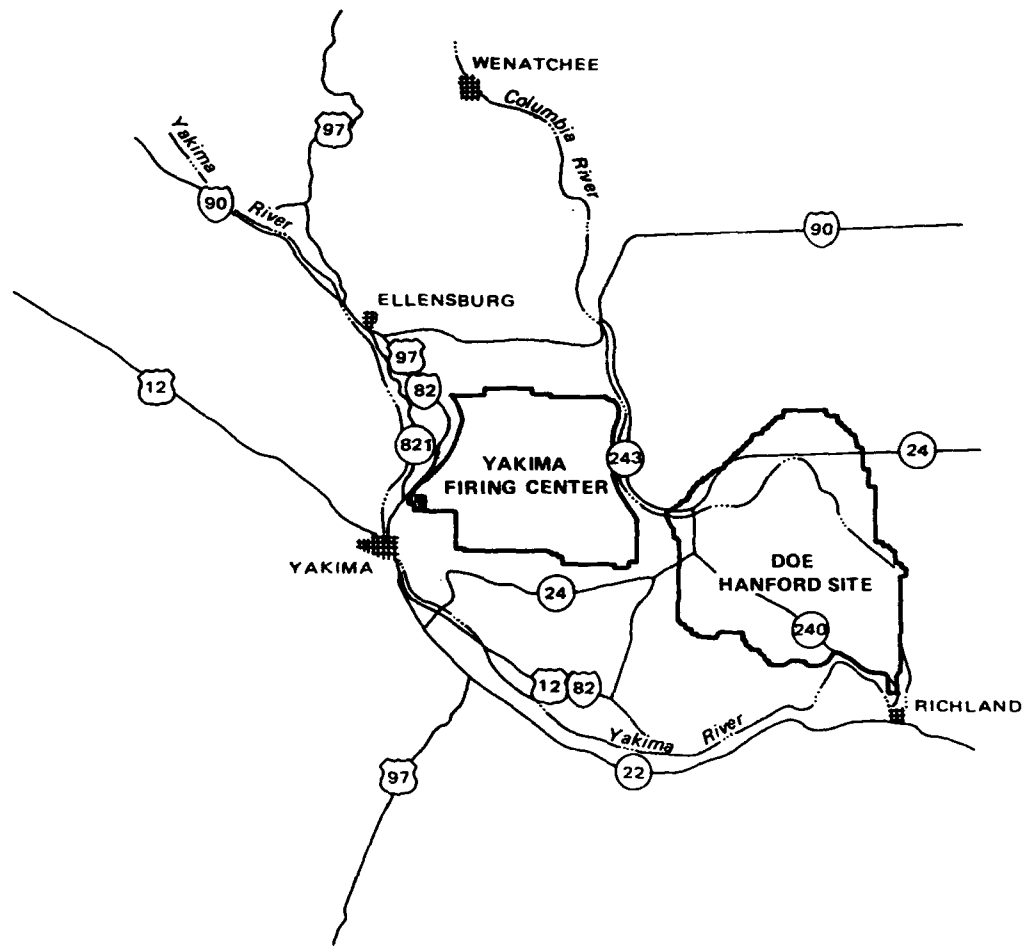
by 25 percent or greater slopes on the Wildcat Mountains located in the southeast portion of the range. Surface water and sand dunes reduce effective area by 9 square miles and 103 square miles, respectively. About 724 square miles of the range consist of fine-grained surficial soils with a shallow ground-water table. Nearly all of these areas are untrafficable year round, further reducing the effective area. The total potentially effective area for system operation, after consideration of all geotechnical factors and areas of overlap, is only 74 square miles.

Mission Compatibility Issues/Accessibility of

Deployment Area: Over one-third of the remaining effective area on the Wendover AFR is used for live and inert air-to-ground weapons delivery. This area is incompatible for random movement and only the inert weapons range could be available for command dispersal.

Of the remaining effective area that may be mission compatible, about half is located at long distances from the Candidate Main Operating Bases in remote areas accessible only by off-installation transit.

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EXPLANATION

- INSTALLATION BOUNDARY
- MAIN HIGHWAYS

AREA NARROWING  
REPORT  
VOLUME I

WASHINGTON COMPLEX

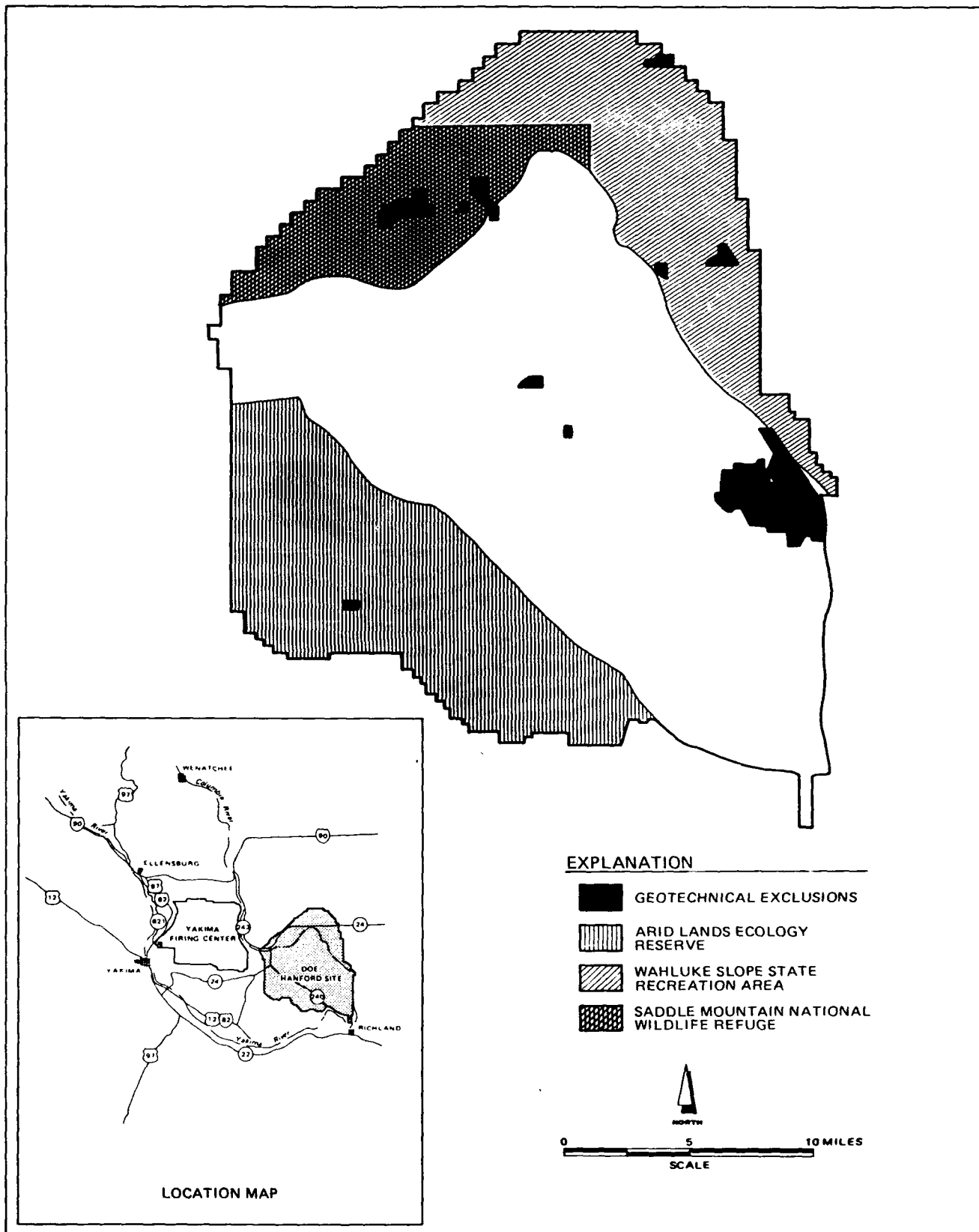
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D-8 Washington Complex

The Candidate Deployment Installations within the Washington Complex are the Department of Energy Hanford Site and Yakima Firing Center (Figure D-8). After application of Evaluative Criteria, both installations remain for further study; however, no determination is made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.



AREA NARROWING  
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DEPARTMENT OF ENERGY HANFORD SITE  
GEOTECHNICAL EXCLUSIONS AND SPECIAL STATUS LANDS

FIGURE  
D-8-1

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D-8.1 Department of Energy Hanford Site, Washington

The Department of Energy (DOE) Hanford Site remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-8-1), and the identification of current mission land use with regard to Small ICBM operations, indicate that sufficient deployment area may be available for deployment of Hard Mobile Launchers. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: The DOE Hanford Site lies approximately 5 miles east of Yakima Firing Range. The Columbia River courses through the northern portion of the DOE Hanford Site, and the Saddle Mountain National Wildlife Refuge is less than 5 miles north of the northern boundary. The tri-city area, consisting of Richland, Kennewick, and Pasco, touches the southeastern tip of the installation. State Highways 240 and 24 cross the Hanford site, and U.S. Highway 12 runs a few miles to the south.

The total land area of the DOE Hanford Site is 562 square miles. The DOE Hanford Site comprises 81 percent land owned in fee by the Department of Energy and 19 percent Bureau of Land Management and Bureau of

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Reclamation withdrawn land. The State of Washington owns 1 square mile near the south-central portion of the site. Two special areas north of the Columbia River are the Wahluke Slope Recreation Area (83 square miles), used by the Washington State Game Department, and the Saddle Mountain National Wildlife Refuge (56 square miles), used by the Federal Fish and Wildlife Service. In the southwest corner of the site, 120 square miles have been designated as an Arid Lands Ecology Reserve, which is part of an ongoing program to study the effects of nuclear activity on the environment.

The DOE Hanford Site is located in south-central Washington within the west-central portion of the Pasco Basin of the Columbia Plateau physiographic province. The area is characterized by west-northwest trending anticlinal basaltic ridges, which may exceed 25 percent slope, and is flanked to the east by the low relief broad alluvial valleys and terraces of the Columbia River. The Rattlesnake and Saddle mountains, located along the southwest and the northernmost boundaries, respectively, and the Gable Mountain in the center of the base, have approximately 32 square miles of land greater than 25 percent slope. Sand dunes are confined to a small, 9-square-mile area along the east-central border of the base. The Columbia River occupies

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approximately 14 square miles of the base, bisecting the northern half of the installation and forming the southeastern base boundary. The Columbia and Yakima Rivers to the south constrain potential on and off-base dash alternatives. Access to the effective area north of the Columbia River is only by public highway across one river crossing at the Vernita Bridge. Access to the southern portion of the reservation is provided by a well-developed network of paved two- and four-lane roads. The combination of these geotechnical factors reduces the potential effective area for system operation to 507 square miles. Consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of the effective area to approximately 508 square miles.

Mission Compatibility Issues: The DOE Hanford Site is used by the U.S. Department of Energy for reactor sites, nuclear material processing plants, and radioactive material waste sites. Radioactive material safety buffer zones have been designated surrounding these sites. Mission compatibility issues remain relative to utilization of land withdrawn for DOE use, scheduling the use of lands currently permitted as a wildlife refuge and a recreation area, and command and control of security forces.



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The Arid Lands Ecology Reserve has been established for environmental studies that could significantly constrain or even preclude Small ICBM operations. Potential selection of the DOE Hanford Site for location of a High Level Radioactive Waste Repository in the mid-1990's could restrict Small ICBM operations in an additional area of at least 48 square miles.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

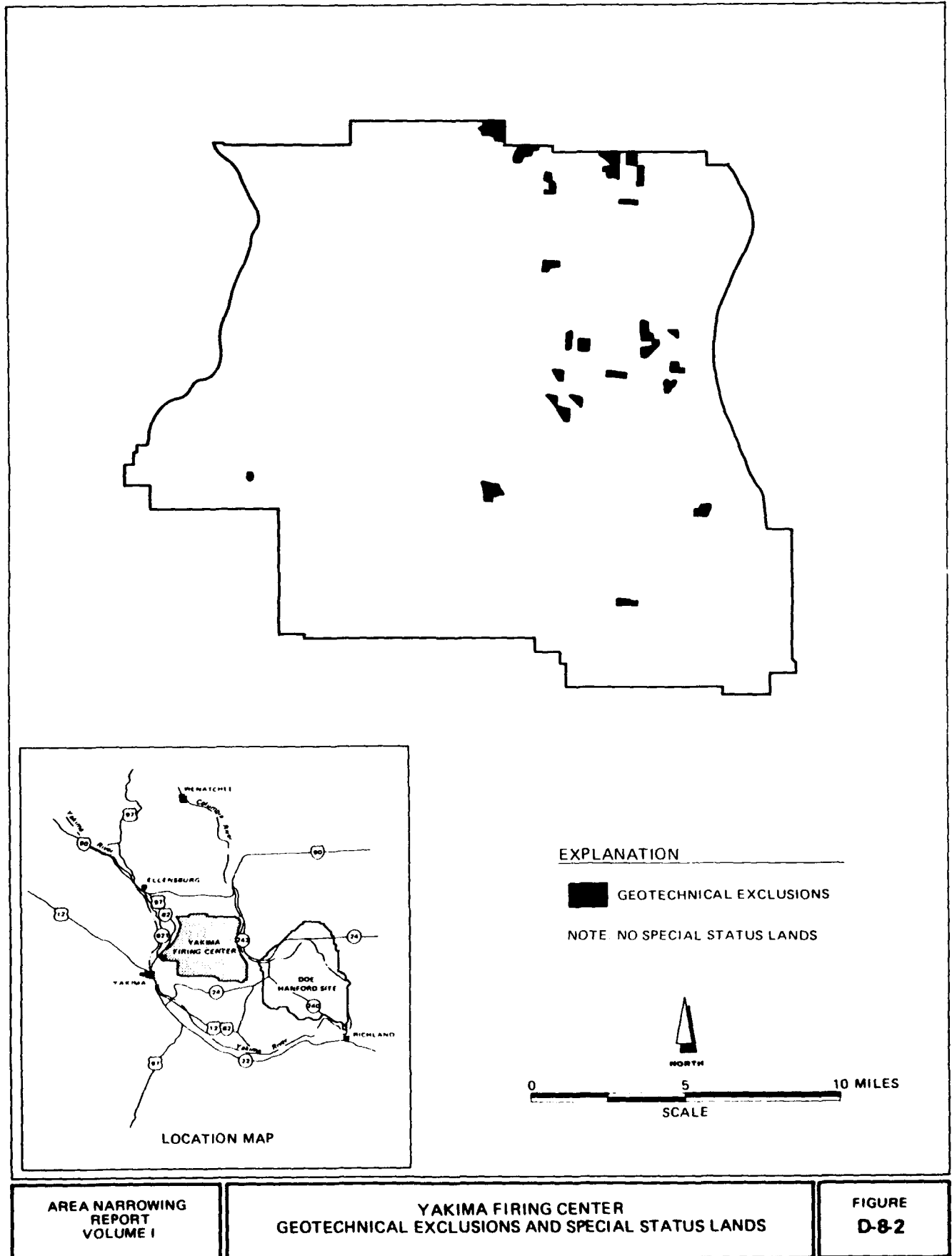
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D-8.2 Yakima Firing Center, Washington

Yakima Firing Center (FC) remains for further, more detailed study as a Deployment Installation. Analysis of effective area with regard to geotechnical factors and existing road networks (Figure D-8-2), and the identification of current mission land use with regard to Small ICBM operations, indicate that land available on a day-to-day basis may be limited by existing missions; however, sufficient land is available for command dispersal and this installation offers significant strategic flexibility. Actual availability depends upon mitigation of remaining mission compatibility issues.

Description: Yakima FC, operated by the Army, is located 6 miles northeast of the city of Yakima in south-central Washington. The installation, 409 square miles in total area, is bordered by Interstate 82 on the west, and the Columbia River flows parallel to the eastern edge. The northern boundary is parallel to and about 6 miles south of Interstate 90; the southern boundary is parallel to but about 10 miles north of State Highway 12. Other population centers near Yakima FC include Ellensburg, located about 15 miles northwest, and the tri-city area (Richland, Kennewick, Pasco), approximately 40 miles to the southeast.

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Yakima FC comprises 89 percent DoD fee-owned land and 11 percent land withdrawn for military use, which is dispersed throughout the range. A very small portion of the land is leased or in easement from private owners.

Approximately 40 archaeological sites are located on both flanks of Yakima Ridge in the southern region of the installation. Approximately 50 sites are located along Hansen Creek and its tributaries in the northern portion of the installation, 14 of which are located in Alkali and Corral Canyons near the eastern boundary. Other verified and potential archaeological sites exist throughout the installation, along with significant areas inhabited by endangered species and other wildlife.

Yakima FC is located within the Columbia Plateau physiographic province. The area and the base are characterized by northwest-trending basaltic ridges with slopes often exceeding 25 percent separated by narrow alluvial valleys. The total area that has slopes greater than 25 percent is 114 square miles. Lower bedrock areas flanking the steeper ridges have an extensive network of unimproved roads used in mission operations. The Columbia River forms much of the eastern base boundary and significantly reduces

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off-base dash capability in an easterly direction. Geotechnical factors reduce effective area for system operation to 294 square miles. However, consideration of installation roads and trails for potential movement of the Hard Mobile Launchers results in an increase of the effective area to approximately 296 square miles.

Mission Compatibility Issues: Yakima FC is used by the Army for platoon to brigade size unit maneuvering, tank and artillery gunnery, tactics training, and live fire exercise. There are a number of ranges used for small arms ground-to-ground ordnance and air-to-ground weapons test and training. These ranges may not be available for Hard Mobile Launcher random movement. Current mobilization plans could further preclude use of ranges by Small ICBM during periods of mobilization. Approximately 20 percent of the random movement area could be available with proper scheduling coordination at any time.

Mission compatibility issues remain relative to security, scheduling, limited base operation support, and impact of Small ICBM operations in training realism.

Significant portions of the deployment area could be accessible using existing roads and/or roads to be developed.

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APPENDIX E

HARD MOBILE LAUNCHER IN RANDOM MOVEMENT BASING MODE  
MAIN OPERATING BASE EVALUATION

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## APPENDIX E

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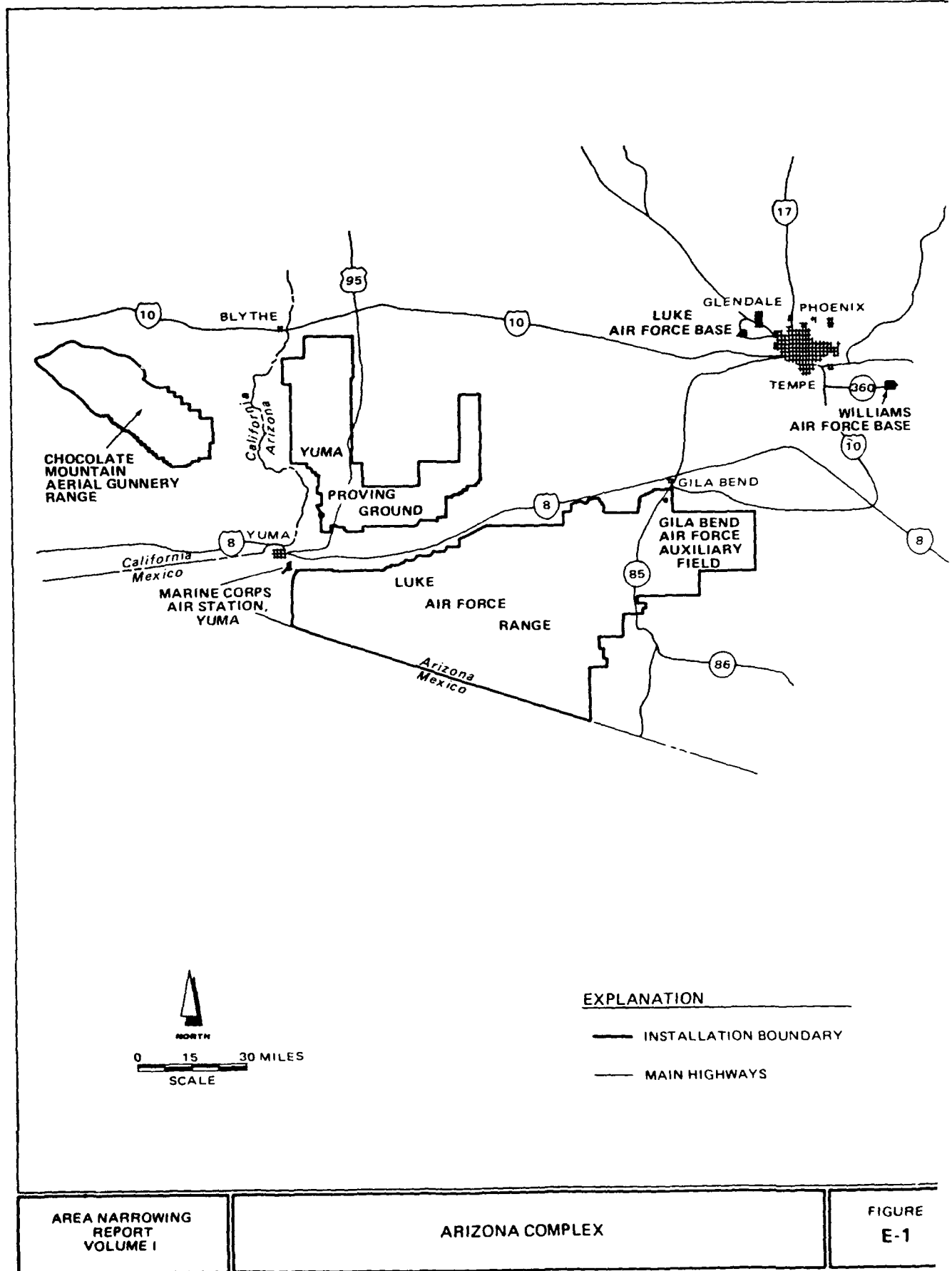
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E-1 Arizona Complex

Following application of Main Operating Base Exclusionary Criteria and Deployment Installation Evaluative Criteria, there remained five Candidate Main Operating Bases within the Arizona Complex. These bases are: Gila Bend Air Force Auxiliary Field; Luke Air Force Base; Williams Air Force Base; Marine Corps Air Station, Yuma; and Yuma Proving Ground (Figure E-1).

After application of Main Operating Base Evaluative Criteria, Gila Bend Air Force Auxiliary Field and Yuma Proving Ground remain for further study; however, no determination has been made as to the overall advisability of using these installations to support an Air Force Strategic Air Command mission. Luke Air Force Base, Williams Air Force Base, and the Marine Corps Air Station, Yuma were eliminated from further consideration; the major influences in this determination are identified below.

Luke Air Force Base - lacks contiguous deployment area and land on base for facility expansion, and the base is asymmetrically located with respect to the potential deployment areas and distant from them.

Marine Corps Air Station, Yuma - lacks contiguous deployment area and has limited land available on base for facility expansion.

Williams Air Force Base - lacks contiguous deployment area, has limited land available on base for facility expansion without excessive mitigation for cultural lands, and the base is asymmetrically located with respect to the potential deployment areas and distant from them.

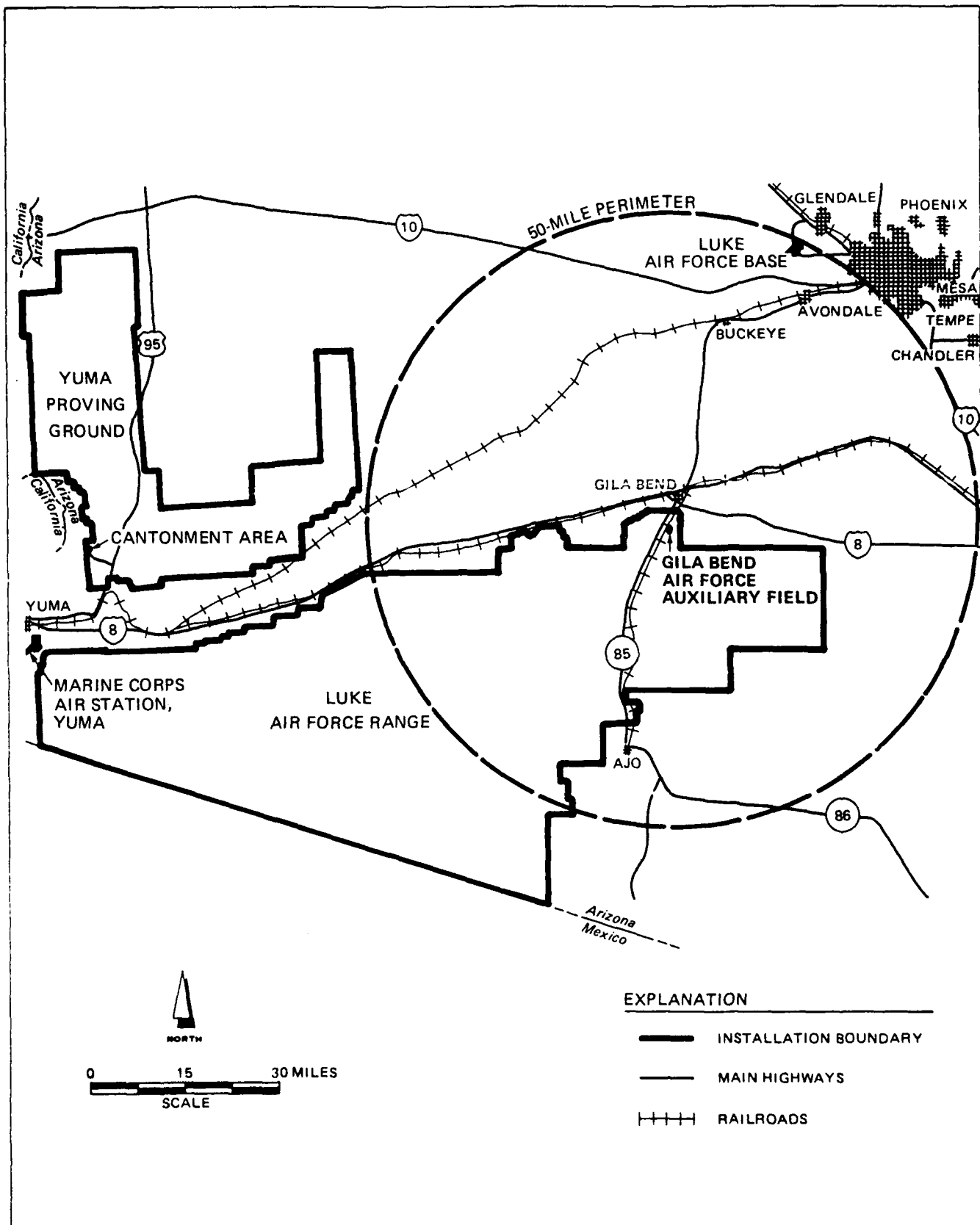
The following sections elaborate on the performance of each Candidate Main Operating Base with regard to the Main Operating Base Evaluative Criteria.

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AREA NARROWING  
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GILA BEND AIR FORCE AUXILIARY FIELD, ARIZONA

FIGURE  
E-1-1

E-6

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**E-1.1 Gila Bend Air Force Auxiliary Field, Arizona**

After evaluating the alternatives for this Complex in relation to each other, Gila Bend Air Force Auxiliary Field (AFAF) remains for further, more detailed study as a Main Operating Base. The base is contiguous with one of the Candidate Deployment Installations, it has abundant land available for Hard Mobile system facilities, and it is an Air Force base.

Gila Bend AFAF is located in southwestern Arizona, approximately 4 miles south of Gila Bend (Figure E-1-1). Phoenix is located approximately 58 miles to the northeast. The Auxiliary Field is operated by the Air Force Tactical Air Command and serves as a support airfield to Luke Air Force Base for on-range training activities. A Main Operating Base at Gila Bend AFAF could support Hard Mobile Launcher deployment at the Arizona Complex.

System Operability: The operational efficiency of Gila Bend AFAF as a Main Operating Base would be degraded by the lack of a nearby support community. The Phoenix urban area (population over 1.4 million), located approximately 58 road miles northeast of the base, is the nearest community with wide range of goods and services. Gila Bend, the nearest community, has minimal support services and a small population



(approximately 1,600). The large potential effective area, as reported in the Mission Compatibility Report, would suggest a high efficiency of maintenance and operations at Gila Bend AFAF. This efficiency would be further enhanced because a portion of the deployment area is contiguous to the base, and the other deployment area is only a short distance from the base. The limited military population (approximately 160) implies that there few on-base support facilities and services. The base does not anticipate a mission change that might increase the availability of its limited support capabilities for the Hard Mobile Launcher mission. Within the Gila Bend AFAF cantonment area, there are approximately 1,885 acres of land available for siting Hard Mobile Launcher system facilities. If additional land is required, new facilities could be constructed on the contiguous Luke Air Force Range. All of the on-base land is withdrawn for military use.

The utility infrastructure at Gila Bend AFAF appears adequate for current base operations, but would require considerable expansion and development to accommodate Hard Mobile Launcher deployment. Electrical power is provided by Arizona Public Service. Although its capacity is unknown, the system is believed to have

expansion potential because of its proximity to the towns of Gila Bend and Ajo. Heat is provided by No.2 diesel fuel stored in an above-ground tank. There are no petroleum or gas pipelines or distribution facilities in close proximity to the base. Waste-water treatment for the base is provided by three on-base lagoons. The one million gallon-per-day capacity of these facilities is more than adequate to meet current demands. The solid waste disposal facilities are capable of meeting future demands with minimal changes. The storm drainage system consists of berm/channel structures that are adequate to divert storm runoff. There are no reliable surface-water supplies available in the area. The potential to further develop local ground-water sources is good, but water quality is poor. The reverse osmosis water treatment facility that provides potable water to the base is adequate for current demands, but would likely require considerable expansion to meet the needs of the Hard Mobile Launcher system.

Gila Bend AFAF has a good transportation system. The base has an uninstrumented, 8,500-foot runway, which provides emergency support for fighter aircraft operating over Luke Air Force Range. Highway access is provided by U.S Highway 85, a two-lane road connecting the base to Interstate 8, approximately 4 miles to the

north. Rail service is provided by the Tucson-Cornelia and Gila Bend Railroad. A rail spur along the west side of the base is used as a storage area for tanker cars.

Because Gila Bend AFAF is an Air Force installation, its personnel and logistic support capabilities are compatible with the Hard Mobile Launcher mission. Luke Air Force Base provides most of Gila Bend AFAF's personnel and logistic support needs.

Gila Bend AFAF has limited community support services as indicated by the distance to Phoenix (58 miles), the nearest community with a wide range of goods, services, and facilities. Gila Bend (population approximately 1,600) is the largest community within 25 miles of the base; its support services are very limited. Off-base housing in Gila Bend is limited. On-base housing is at maximum occupancy.

Public Impacts: The increased water demand from Hard Mobile Launcher system personnel and their dependents could have an effect on the Gila Bend area, even though a percentage of base personnel would choose to live in the Phoenix urban area. It is likely that sufficient ground water is available via direct development, although water is of poor quality in some areas, requiring more than conventional treatment prior to

domestic use. No reliable surface-water source is available for use by the Hard Mobile Launcher system.

Although the base is contiguous with one of its two associated Candidate Deployment Installations, public safety and security concerns would be increased due to the need for Hard Mobile Launchers to traverse public roads to reach the Yuma Proving Ground Candidate Deployment Installation.

Deployment of the Hard Mobile Launcher system at Gila Bend AFAF could raise social and economic concerns in the small community of Gila Bend, if it were to absorb the entire influx of support personnel. However, in spite of the rather long commuting distance, the Phoenix urban area would likely absorb most of the population influx. The Phoenix urban area can provide a full range of goods and services. Nonagricultural employment in the region is sufficiently high to avoid the consequences of immigration of project-related workers. Regional employment in the construction and military sectors is high, which suggests that project-related workers who do immigrate are likely to have backgrounds similar to those of the resident population. The economic diversity of the region is relatively high as indicated by the number of export-producing industries. Local governments in the

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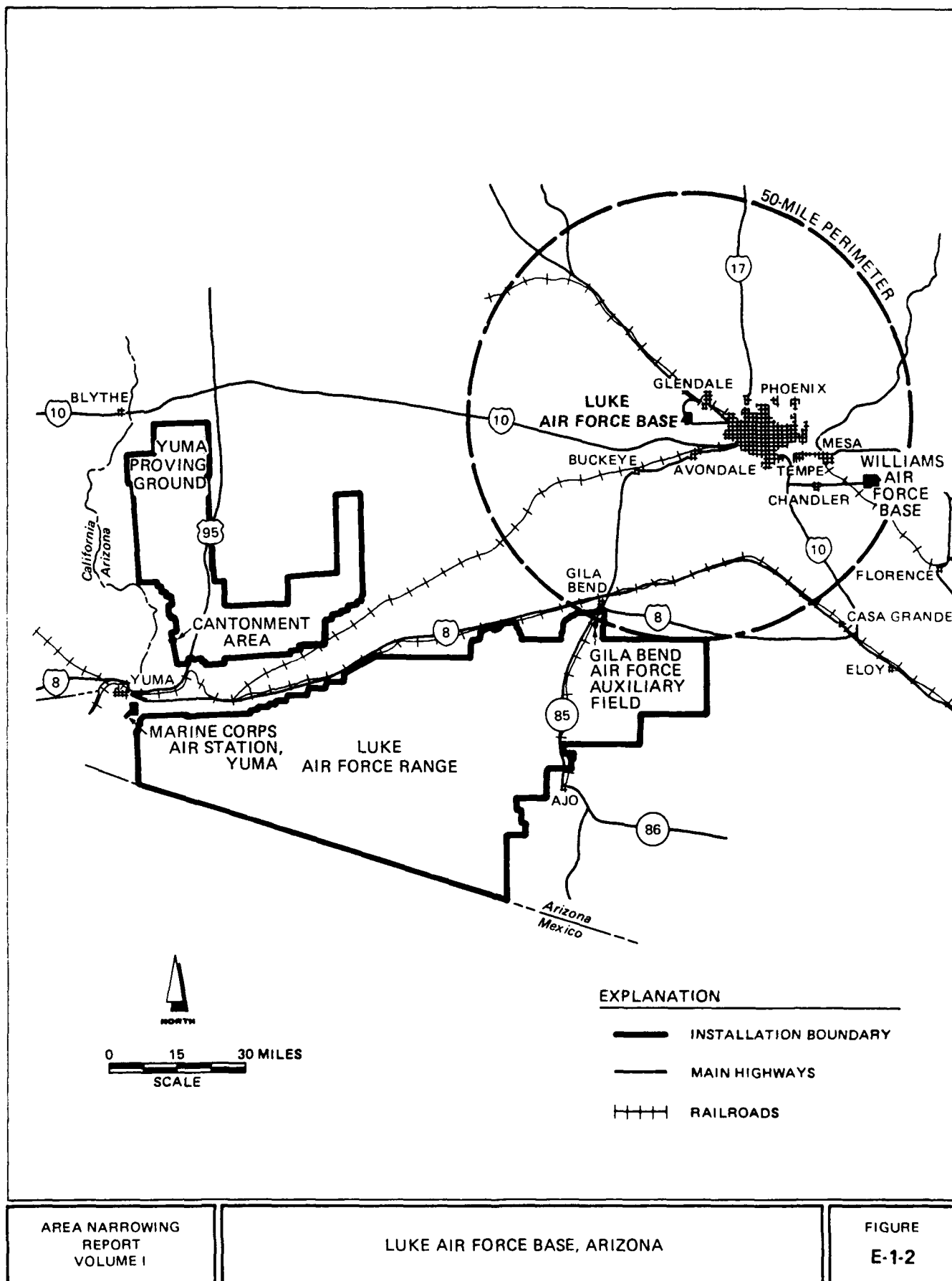
region should be able to capture tax revenues in the short term to address potential expenditure demands. Although Gila Bend can provide only very limited housing, the Phoenix area contains considerable available housing.

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E-13

SENSITIVE



### E-1.2 Luke Air Force Base, Arizona

After evaluating the alternatives for this Complex in relation to each other, Luke Air Force Base (AFB) was eliminated from further study as a Main Operating Base. Major influences in this determination were the lack of a contiguous deployment area, the asymmetrical location of the base with respect to the potential deployment areas, the distance of the base from the deployment areas, and the lack of land on base for facility expansion.

Luke AFB is located in south central Arizona, approximately 8 miles northwest of Phoenix, the largest population center in Arizona (Figure E-1-2). The base currently supports an Air Force Tactical Air Command training mission. A Main Operating Base at Luke AFB could support the Arizona Complex.

System Operability: The operational efficiency of Main Operating Base activities at Luke AFB would be enhanced by the proximity to Glendale (4 miles), the nearest support community with a wide range of goods and services. The large potential effective area, as reported in the Mission Compatibility Report, suggests that Luke AFB would provide high efficiency in maintenance and operations. However, this efficiency would be reduced because of the asymmetrical location



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of the base with respect to the deployment areas, and its distance from them. The apparent ability of the base to provide many support services and facilities for the Hard Mobile Launcher system is indicated by the large number (over 5,800) of assigned military personnel. There are, however, no anticipated reduction in operations that might increase the availability of these facilities for the Hard Mobile Launcher mission. On-base land to support Hard Mobile Launcher system facilities, including Weapons Storage Area/Stage Storage Area facilities, is severely constrained. Off-base expansion potential is highly constrained by urban development trends. The base has a total of 4,198 acres, all of which is DoD fee-owned.

The base utility infrastructure appears adequate for current operations; the proximity of the base to Phoenix provides the potential for expanding the present utility capacity to meet future needs. Electrical power is provided by Arizona Public Service. Natural gas, provided by the Southwest Gas Company, is used for heating. The base operates its own waste-water treatment facilities with an excess capacity of 0.3 million gallons-per-day; additional expansion with connections to Glendale city facilities is planned for 1987. Solid waste is collected by a private contractor and is disposed of in a leased

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landfill that is potentially expandable to an unused 33-acre site. Storm drainage facilities are adequate to handle runoff conditions. Surface water may be available to meet Hard Mobile Launcher system construction and operation requirements when the Central Arizona Project is completed in 1986. Additional water could be available through purchase/transfer of existing agricultural water rights; however, overdrafting of ground-water basins would continue. Water quality may be locally poor and water may require more than conventional treatment prior to domestic use.

Luke AFB has a complete transportation system. The base has two fully instrumented, parallel runways, one 10,000 long feet and the other 12,000 feet long. Interstate Highways 17 and 10 are located approximately 15 and 6 miles, respectively, east and south of the base; each is accessible by four-lane county roads. A railroad spur enters the base from the north and continues to the bulk fuel tank storage area.

Because the base is operated by the Air Force, the existing personnel and logistic support systems would be compatible with the Hard Mobile Launcher mission.

The support services for Luke AFB are generally good, although housing availability is limited. The base is

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close to Glendale and the Phoenix area, which provide a wide range of goods, services, and facilities. The availability of off-base housing is adequate, but units for lower income families are scarce. The base housing, which has a current occupancy rate of 99 percent, cannot meet existing mission requirements.

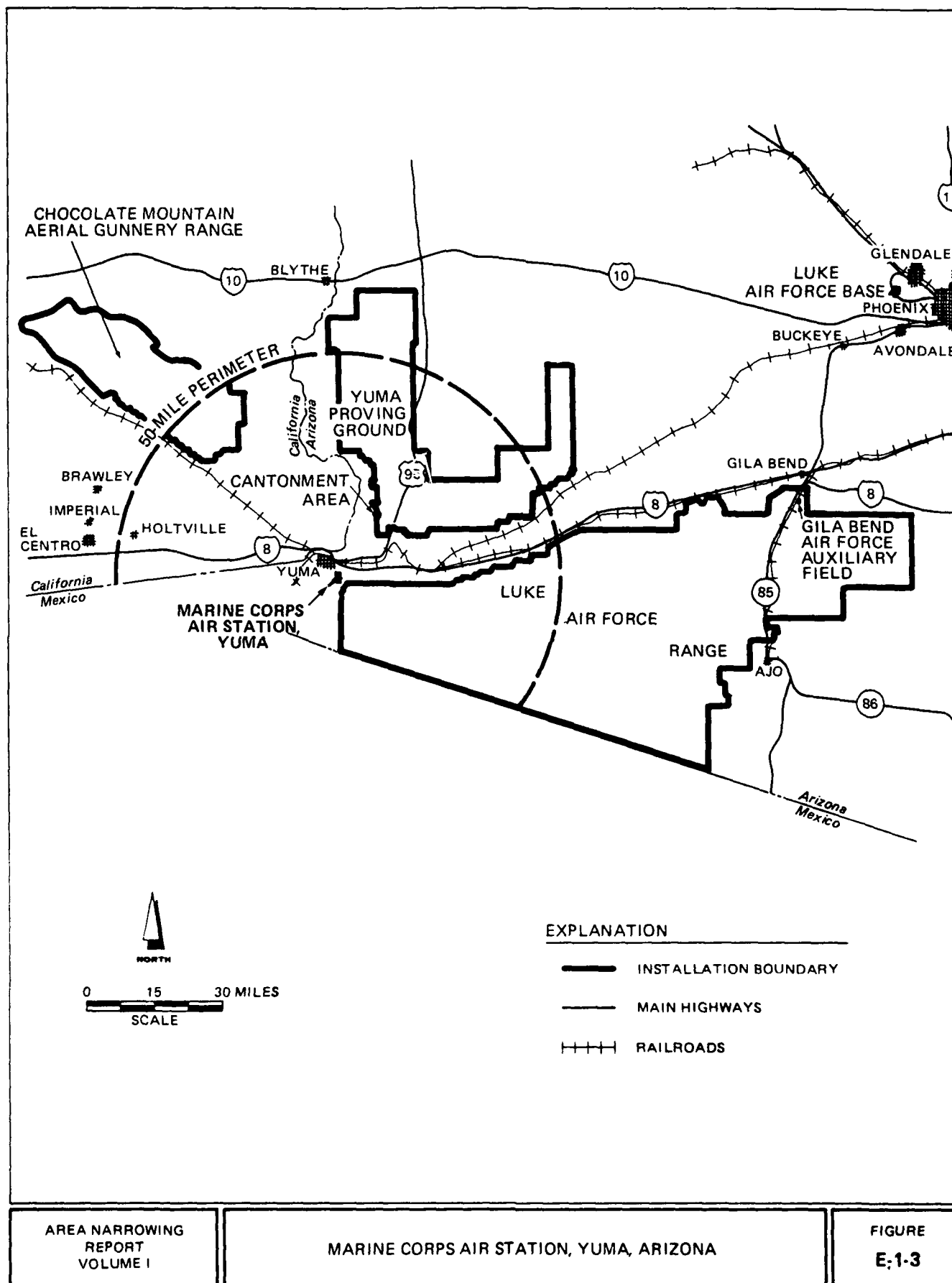
Public Impacts: The water demand in support of deployment of the Hard Mobile Launcher system is expected to have a minimal effect on the surrounding communities because water is potentially available from the Central Arizona Project and possible purchase/transfer of ground-water rights. However, use of ground water would continue current overdrafting. Ground water may be of poor quality in some areas, requiring more than conventional treatment prior to domestic use.

Public safety and security concerns are increased because the long travel distance from the Main Operating Base to the deployment areas requires considerable travel of Hard Mobile Launchers on public roads.

The three-county region of influence surrounding the base has a large population, and should be able to provide a wide range of goods, services, and facilities. The likelihood of immigration of

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project-related workers is reduced because of the number of nonagricultural workers in the region. Regional employment in the construction and military sectors is also high, which means that new workers are likely to have backgrounds similar to those of the resident population. The economic diversity of the region is comparatively high, as indicated by the number of export-producing industries in the area. Local governments in the region would likely be able to capture tax revenues in the short term to address potential expenditure demands. The region contains many available housing units, and the support community can provide ample housing.



**E-1.3 Marine Corps Air Station, Yuma, Arizona**

After evaluating the alternatives for this Complex in relation to each other, Marine Corps Air Station (MCAS), Yuma, was eliminated from further study as a Main Operating Base. Major influences in this determination were the lack of a contiguous deployment area and the limited land available on base for facility expansion.

MCAS Yuma is located in southwestern Arizona, immediately adjacent to the city of Yuma (Figure E-1-3). Phoenix is located approximately 157 miles to the northeast. The base provides aerial weapons delivery training. A Main Operating Base at MCAS Yuma could support the Arizona Complex.

System Operability: The efficiency of Main Operating Base activities would be enhanced by the proximity to a community that can provide a full range of goods and services. The support community of Yuma is adjacent to the base on the north and west sides. The large potential effective area, as reported in the Mission Compatibility Report, suggests that MCAS Yuma would provide a high efficiency of maintenance and operations. This efficiency would be further enhanced by the base's close proximity to both deployment areas. The large number of military personnel (approximately 5,200)

implies that there are many on-base support services and facilities. However, MCAS Yuma is currently experiencing growth attributed to the conversion of the three existing F-4 squadrons to Harrier Squadrons, and the addition of a fourth squadron expected in the next few years. The expected growth would make these facilities and services less available for the Hard Mobile Launcher mission. The base contains over 3,000 acres of land, of which 80 percent is DoD fee-owned. Land available for expansion of facilities including Weapon Storage Areas/Stage Storage Areas is very constrained. It appears that only 285 acres are potentially available for expansion, but all of this area may be required to accommodate future mission growth. Off-base expansion is constrained by residential development.

The utility infrastructure at MCAS Yuma appears adequate for current base operations and has a potential for increased capacity to meet future requirements. The electrical power and gas heating systems are believed to be capable of meeting increased demand. Waste-water treatment demands can be increased by 40 percent under a co-use agreement with the Yuma Municipal Wastewater Facility, bringing the total capacity to 1.2 million gallons-per-day. Solid waste is collected by a private contractor and deposited at

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the Yuma County landfill, which has adequate capacity to meet current needs and is believed to have potential for expansion. The storm drainage system is capable of diverting the typically infrequent seasonal precipitation. Water for the base is obtained from the Colorado River via an open, concrete-lined canal. Additional water supplies are likely available from either the Colorado River or ground-water sources, but in the latter case water would be of poor quality in some areas and may require more than conventional treatment prior to domestic use.

MCAS Yuma has a complete transportation system. The base has a fully instrumented, 13,000-foot runway that serves both civilian and military aircraft. Highway access is provided by Interstate Highway 8 and U.S. Highway 95, approximately 2 and 2.5 miles to the north, respectively. Rail service is provided by a spur that connects the cantonment area with the Southern Pacific Railroad, 3 miles to the north.

Because MCAS Yuma is a Marine Corps installation, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

The support services for MCAS Yuma are fairly good, as indicated by the availability of housing and the



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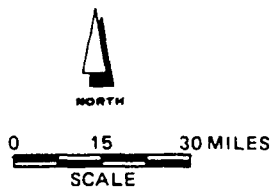
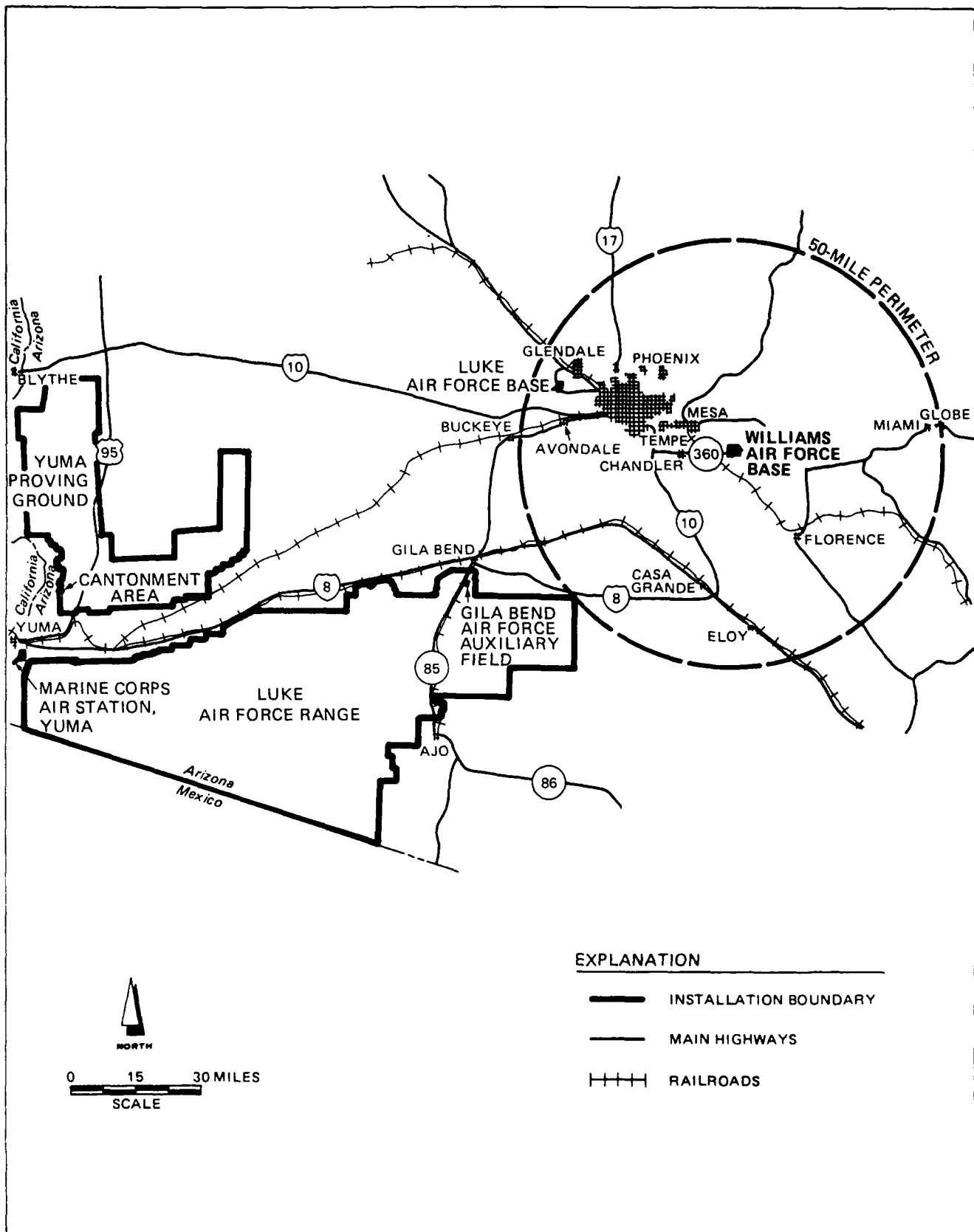
proximity to a support community. The city of Yuma, with a population of approximately 55,000, is adjacent to the base and can provide a wide range of support services. On-base housing is presently at maximum occupancy. Additional housing units are under construction but will be fully utilized by current projected mission growth. Available off-base housing is limited.

Public Impacts: The potential effect on the support community of increased water demand in support of deployment of the Hard Mobile Launcher system is expected to be minimal, because of the apparent availability of good quality Colorado River water. Additionally, ground-water supplies are also abundant, but water may be of poor quality locally and may require more than conventional treatment prior to domestic use.

Public safety and security concerns are increased because of the distance that Hard Mobile Launchers would have to travel over public roads to reach the deployment areas.

Although the city of Yuma can provide a reasonably wide range of goods and services, the outlying areas of the region have very limited goods and services for support of system construction and operation. Nonagricultural

employment in the region is very low, increasing the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is also low, which suggests that workers who immigrate are likely to have backgrounds dissimilar to those of the resident population. The economic diversity of the region is moderately low as indicated by the relatively few export-producing industries in the area. Local governments in the region have a very low relative ability to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the support community is limited, and housing availability in the region is also low.



EXPLANATION

- INSTALLATION BOUNDARY
- MAIN HIGHWAYS
- ++++ RAILROADS

AREA NARROWING  
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WILLIAMS AIR FORCE BASE, ARIZONA

FIGURE  
E-1-4

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E-1.4 Williams Air Force Base, Arizona

After evaluating the alternatives for this Complex in relation to each other, Williams Air Force Base (AFB) was eliminated from further study as a Main Operating Base. Major influences in this determination were the lack of contiguous deployment area, the asymmetrical location of the base with respect to the potential deployment areas and its distance from them, and the limited land available on base for facility expansion without excessive mitigation for cultural resources.

Williams AFB is located in south-central Arizona, approximately 17 miles southeast of Phoenix (Figure E-1-4). The base supports an Air Force Air Training Command mission. A Main Operating Base at Williams AFB could support the Arizona Complex.

System Operability: The efficiency of Main Operating Base activities at Williams AFB would be enhanced by the proximity to Mesa (7 miles), the nearest community with a wide range of goods and services. The large potential effective area, as reported in the Mission Compatibility Report, would suggest that Williams AFB could support efficient maintenance and operations. However, this efficiency would be reduced because of the asymmetrical location of the base with respect to the deployment areas, and its long distance from them.

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The number of assigned military personnel (approximately 3,200) implies that the base can provide adequate support services and facilities for the Hard Mobile Launcher system. The availability of these facilities for the Hard Mobile Launcher mission may not increase because no reduction in base activities is expected. Land available for facility expansion at Williams AFB is constrained. Although the base contains 4,548 acres of land, the presence of an important archaeological site is a major constraint to development of the unused portions. This site is of National Register quality and is a candidate for inclusion on the Federal list. Future development of this land would require that mitigating measures be developed and implemented. Ninety percent of the land on the base is DoD fee-owned.

The utility infrastructure at Williams AFB is adequate for current base operations, and the proximity to Mesa presents a high potential to expand the present utility capacity to meet future needs. A proposed electrical power upgrade will increase available power by 67 percent over present use. A 50 percent increase in the supply of gas for heating is available from the Southwest Gas Company. Solid waste is collected by a private contractor and disposed of at county facilities. Waste-water treatment facilities on base

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have a capacity of 1 million gallons-per-day. Present demand varies from 35 to 110 percent of capacity. The facilities have limited expansion capabilities. The base has a channel/dike storm drainage system designed to divert off-base area runoff around the base perimeter. Adequate on-base drainage consists of storm sewers, open ditches, culverts, and gutters. Surface water may be available to meet mission construction and operation requirements when the Central Arizona Project is completed in 1986. In addition, ground water may be developed or purchased, or water rights may be transferred, but current overdrafting would continue. Surface-water quality is good, but ground-water quality is locally poor and the water may require more than conventional treatment before domestic use.

Williams AFB has a good transportation system. The base has two parallel, fully instrumented runways greater than 10,000 feet long. Interstate Highway 10 and State Highway 360 provide access to the area, but congestion can be heavy during peak traffic hours. A railroad spur that once ran on base has been removed and the right-of-way sold.

Because the base is operated by the Air Force, the existing personnel and logistic support systems would be compatible with Hard Mobile Launcher system operations.

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The support services for Williams AFB are good, as indicated by the proximity to the support community and the availability of housing. The base is close to Mesa and surrounding communities of the Phoenix urban area, which can provide a wide range of goods, services and facilities. Although on-base housing is at capacity and no plans for expansion are being developed, Mesa and other communities offer available housing units within 10 miles of the base.

Public Impacts: The water demand in support of deployment of the Hard Mobile Launcher system is expected to have a minimal effect on the surrounding communities, because of water available from the Central Arizona Project and possible purchase/transfer of ground-water rights. Extensive use of a ground water supply, however, would continue overdrafting.

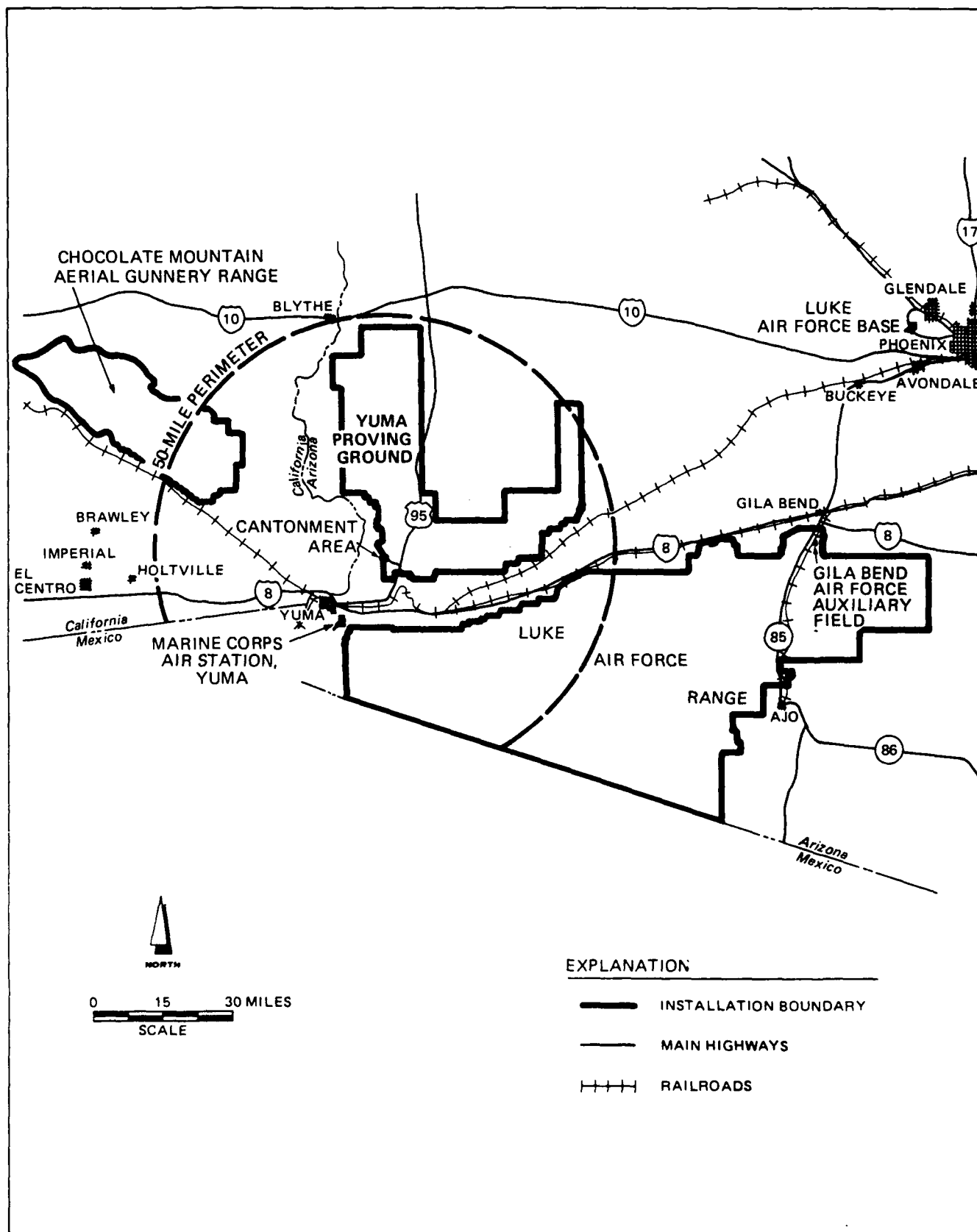
Public safety and security concerns are increased because the long travel distance from the Main Operating Base to the deployment areas requires considerable travel of Hard Mobile Launchers on public roads.

The three-county region of influence surrounding the base provides a wide range of goods and services. The Phoenix urban area, which includes the support community of Mesa, has a total population of more than

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1.4 million. Nonagricultural employment in the region is high, which implies that there would be a small requirement for immigration of project-related workers. Regional employment in the construction and military sectors is relatively high, which would reduce the influx of workers with backgrounds dissimilar to those of the resident population. The economic diversity of the region is high, as indicated by the number of exporting firms located there. The local governments in the region should be able to capture tax revenues in the short run to address potential expenditure demands. The support community can provide a sizeable number of housing units.





AREA NARROWING  
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YUMA PROVING GROUND, ARIZONA

FIGURE  
E-1-5

**E-1.5 Yuma Proving Ground, Arizona**

After evaluating the alternatives for this Complex in relation to each other, Yuma Proving Ground (PG) remains for further, more detailed study as a Main Operating Base. The base has abundant land available for facility expansion, the Main Operating Base is contiguous with one of the Candidate Deployment Installations, supplies of both ground and surface water appear to be sufficient for system deployment, and there is a nearby community with a wide range of goods and services.

Yuma PG is located in southwestern Arizona, northeast of the confluence of the Gila and Colorado Rivers, and is approximately 24 miles north of the city of Yuma (Figure E-1-5). Yuma Proving Ground is an Army installation used for testing and evaluation, product improvement, and acceptance testing of all types of weapons and ammunitions. A Main Operating Base at Yuma PG could support the Arizona Complex.

System Operability: The efficiency of the Main Operating Base activities would be enhanced by the proximity to Yuma, the nearest community with a wide range of goods and services. The large potential effective area, as reported in the Mission Compatibility Report, suggests a high efficiency of

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maintenance and operations at Yuma PG. This efficiency would be further enhanced because the base is contiguous to one deployment area and only a short distance from the other. The limited military population (approximately 420) implies that there are few on-base support facilities and services. The base anticipates no reduction in operations that might increase the availability of these facilities and services for the Hard Mobile Launcher mission. Because the Yuma PG cantonment area is contiguous with the range area, available land for facility expansion is unconstrained. Presently, 99 percent of the base land is land withdrawn for military use.

The utility infrastructure at Yuma PG appears adequate for current base operations, with a potential to increase capacity to meet future demands. Existing peak electrical power usage is approximately 50 percent below the maximum capacity of 12.5 megawatts. Fuel oil is the primary fuel for heating, but the natural gas distribution system could be expanded. Waste-water treatment facilities, which are considered adequate and in good condition, consist of a series of separate septic tanks or sewage lagoons with a total capacity of 0.74 million gallons-per-day. Solid waste is deposited in an on-base landfill that is believed to be adequate to meet base requirements, and has potential for

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expansion. The storm drainage system is minimal but considered adequate to handle the infrequent seasonal precipitation. Good quality surface water is potentially available by purchase from the Colorado River. Ground water could be developed without a permit, but water quality would be below established drinking standards in local areas. A water treatment facility is presently under construction, but capacity will be sufficient only to meet present base demands.

Yuma PG has a fairly good transportation system. The base has one 6,000-foot and one 5,030-foot instrumented asphalt runway, but land is available for expansion. U.S. Highway 95, a two-lane asphalt highway, serves as the main north-south route through the installation and the main route to Yuma. The highway provides access to Interstate 10, located 60 miles to the north, and Interstate 8, located 22 miles to the south. No direct rail service is available on the installation. However, rail service is provided by a base-owned, one-mile spur that connects to the Southern Pacific Railroad, located 17 miles south of the cantonment area.

Because Yuma PG is an active Army training and testing installation, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

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Yuma PG has good support services, as indicated by the availability of housing and the proximity to a support community. Yuma, with a population of approximately 55,000, can provide a wide range of goods, services, and facilities. On-base housing is in good condition and in excess of current mission requirements. Limited off-base housing is available in Yuma.

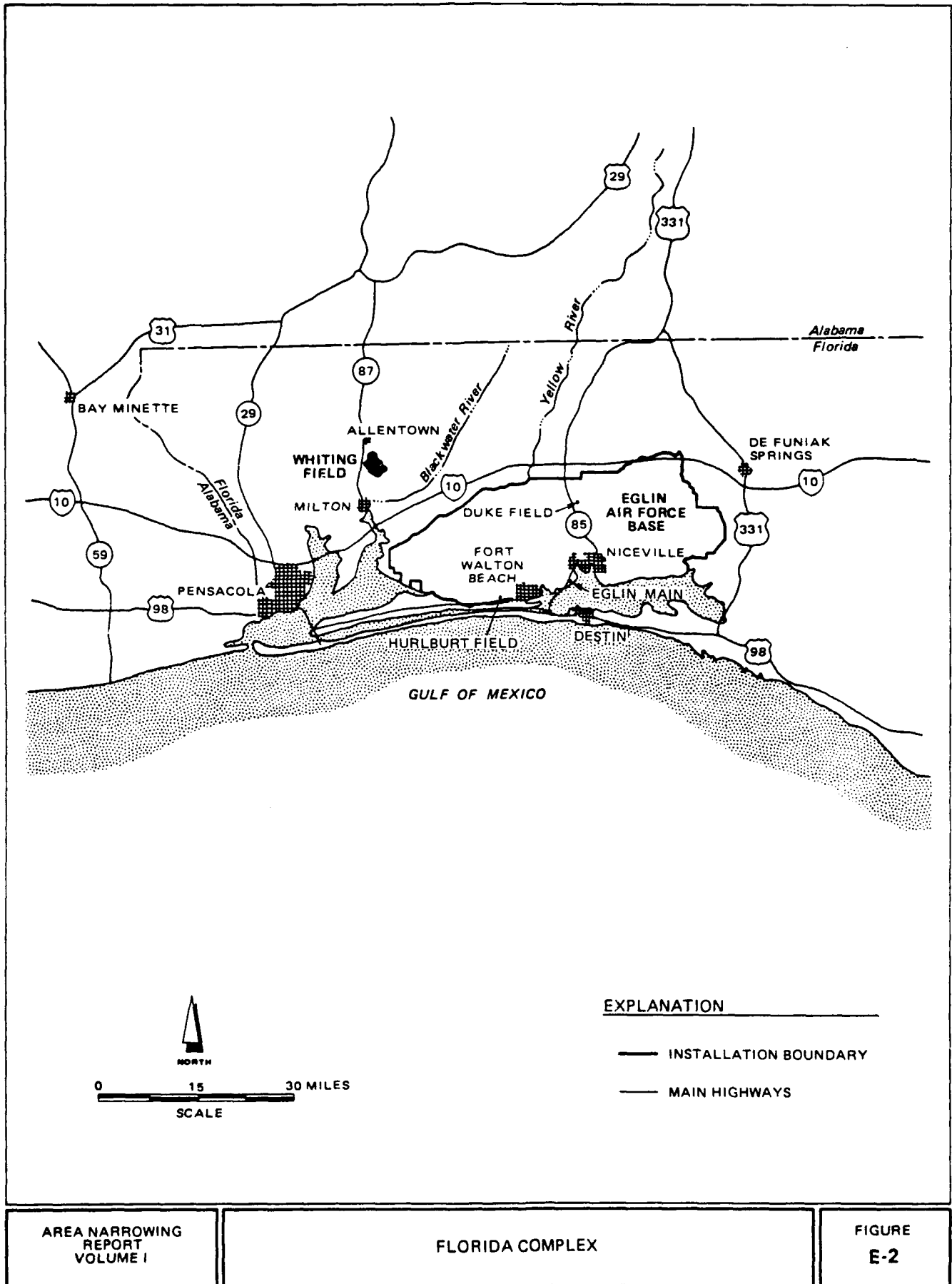
Public Impacts: The effect of increased water demand of an induced work force and their dependents from deployment of the Hard Mobile Launcher system on the support community is expected to be minimal because of the apparent availability through purchase of Colorado River water and/or direct development or purchase of ground-water supplies. In the latter case, water quality could be a limiting factor.

Although the base is contiguous to the Yuma PG range, the base is within a short travel distance of Luke AFR. Public safety and security concerns would be increased due to the travel of Hard Mobile Launchers over public roads to reach the Luke AFR deployment areas.

Although the city of Yuma can provide a reasonably wide range of goods and services for base personnel, the outlying areas of the region have very limited goods and services for support of system construction and operation. Nonagricultural employment in the region

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is very low, which increases the likelihood of immigration of project-related workers. In addition, regional employment in the construction and military sectors is relatively low. This implies that new workers may have backgrounds dissimilar to those of the resident population. The economic diversity of the region is moderate, as indicated by the number of export-producing industries. Local governments in the region have a low relative ability to capture tax revenues in the short term to address potential expenditure demands. Although the support community can provide only a limited amount of housing, the availability of housing in the region is very good.



## E-2 Florida Complex

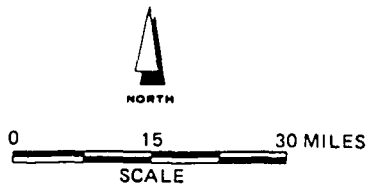
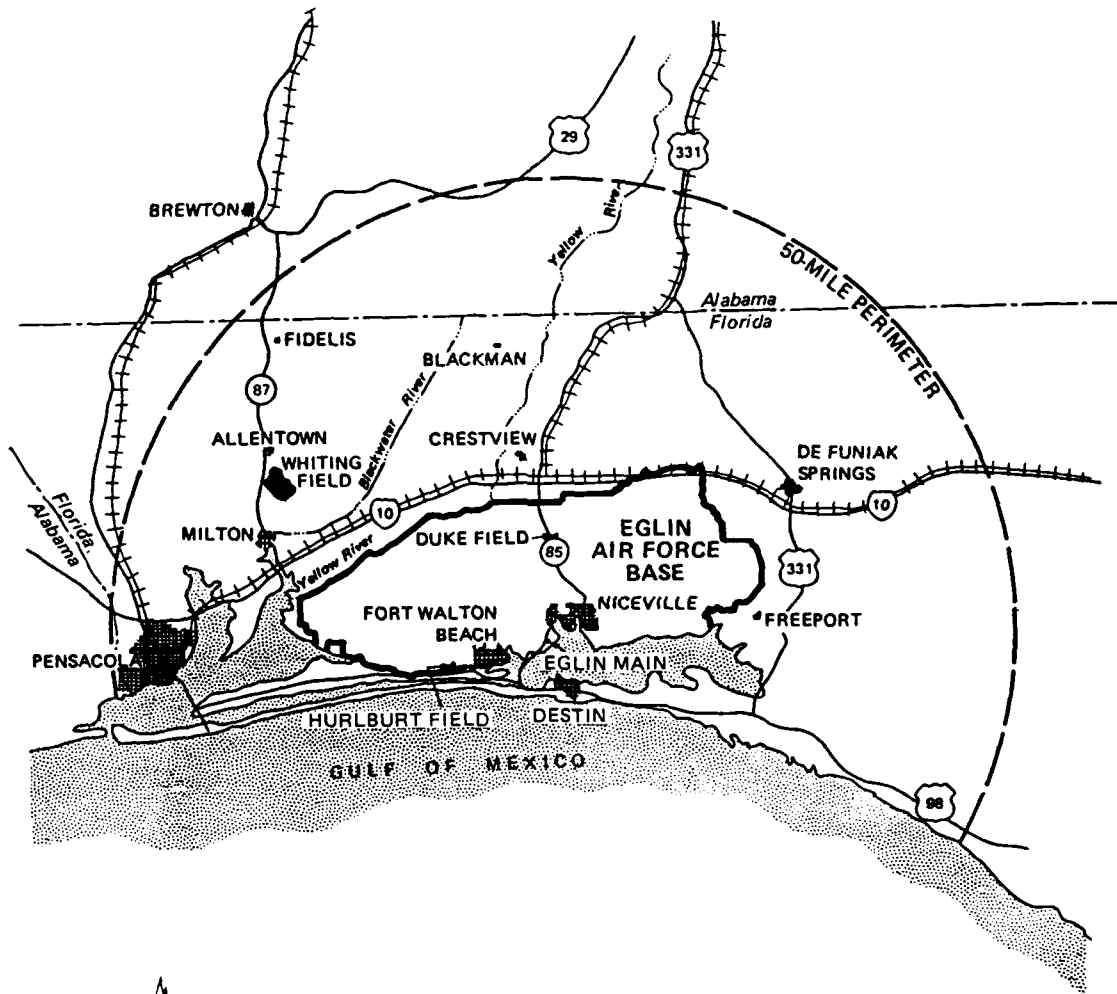
Following application of Main Operating Base Exclusionary Criteria and Deployment Installation Evaluative Criteria, there remained two Candidate Main Operating Bases within the Florida Complex. These bases are: Eglin Air Force Base and Whiting Field Naval Air Station (Figure E-2).

After application of Main Operating Base Evaluative Criteria, Eglin Air Force Base remains as a Candidate Main Operating Base for further study; however, no determination is made at this time as to the overall advisability of using this Air Force Systems Command Base to support an Air Force Strategic Air Command mission.

The major influences in the determination to eliminate Whiting Field Naval Air Station were the lack of contiguous deployment area, the distance from the base to the potential deployment area, and limited land available on base for facility expansion.

The following sections elaborate on the performance of each Candidate Main Operating Base with regard to the Main Operating Base Evaluative Criteria.





EXPLANATION

- INSTALLATION BOUNDARY
- MAIN HIGHWAYS
- RAILROADS

AREA NARROWING  
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EGLIN AIR FORCE BASE, FLORIDA

FIGURE  
E-2-1

#### E-2.1 Eglin Air Force Base

After evaluating the alternatives for this complex in relation to each other, Eglin Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. Within the Eglin AFB Candidate Deployment Installation there are three separate on-base cantonment area options for locating the facilities of the Main Operating Base: Eglin Main, Hurlburt Field, and Duke Field (Figure E-2-1). Each of these areas has a good transportation system, sufficient surface- and ground-water sources to accommodate the Hard Mobile Launcher system requirements, sufficient land of favorable ownership available for facilities expansion, favorable utility infrastructure conditions, contiguous location with the deployment area, and all are Air Force installations.

Eglin AFB is located in northwestern Florida, adjacent to Fort Walton Beach and approximately 15 miles east of Pensacola (Figure E-2-1). Eglin AFB is bounded on the south by Choctawhatchee Bay and Santa Rosa Sound and on the west by Pensacola Bay, all large bodies of water connected to the Gulf of Mexico. The three cantonment area options, Eglin Main, Hurlburt Field, and Duke Field, are located 8 miles northeast, 6 miles west, and 21 miles north of Fort Walton Beach, respectively. The

base is operated by the Air Force Systems Command Armament Division and its tenants, and is used for conducting research, development, testing, training, and evaluation of weapons, systems, components, and related equipment. The Eglin AFB Main Operating Base could support the Eglin Air Force Base Candidate Deployment Installation.

System Operability: The efficiency of Main Operating Base activities, if located at Eglin Main or Hurlburt Field, would be enhanced by the short distance to Fort Walton Beach (8 miles and 6 miles, respectively), the nearest support community. The short distance would decrease the time required for transport of services, goods, and personnel to the base. Operational efficiency for Duke Field would be slightly reduced, in comparison to Eglin Main or Hurlburt Field, by the longer distance (21 miles) to Fort Walton Beach. The low efficiency of maintenance and operations at Eglin AFB and Duke Field, which is at the minimum acceptable level because of the small potential effective area, as reported in the Mission Compatibility Report, would be mitigated because the base is contiguous to and centrally located within the deployment area. Hurlburt Field is asymmetrically located with respect to the deployment area. There are approximately 1,700 military personnel at Duke Field, 12,000 at Eglin Main,

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and 4,300 at Hurlburt Field. A large military population, such as at Eglin Main or Hurlburt Field, implies that there are a large number of existing on-base support services and facilities. Fewer personnel at Duke Field would imply fewer existing services and facilities than at the other two locations. However, the possible addition of a major mission, related to cruise missile testing or to the Strategic Defense Initiative, could reduce the availability of existing facilities for the Hard Mobile Launcher mission. Sufficient land is available to accommodate new Weapons Storage Area/Stage Storage Area facilities because all three cantonment areas are contiguous with the deployment area. Available land at Eglin AFB is 71 percent DoD fee owned and 29 percent withdrawn for military use.

The base utility infrastructure at Duke Field, Hurlburt Field, and Eglin Main cantonment areas appears adequate for current operations, with potential for expansion. Electrical power is supplied to all three cantonment areas by the Gulf Power Company and Choctawhatchee Electric Cooperative, with a capacity to accommodate significant increased demand. Natural gas is supplied by the Okaloosa Gas District and is the primary heating source, although some fuel oil and propane are used. The natural gas system has the capability to quadruple

its delivery. Waste-water treatment is handled separately by each cantonment area. Duke Field has an aeration treatment plant capable of treating approximately 250,000 gallons of waste water per day; this capacity appears adequate for present needs, but would likely require expansion to accommodate another mission. Eglin Main is served by a 500,000 gallon-per-day treatment facility. The plant and associated sewer lines are undergoing a major expansion in capacity. Hurlburt Field has a 728,000 gallon-per-day treatment plant, which is adequate to meet present demand but is presently undergoing expansion. Solid wastes for all three cantonment areas are adequately disposed of at a sanitary landfill operated by the Okaloosa County Sanitation Department. The storm drainage systems for each area appear adequate for existing facilities, but would likely require expansion if additional facilities are constructed. The present water-supply system appears adequate to meet present demand at both Duke Field and Hurlburt Field, while the system at Eglin Main has a capacity of approximately 17 percent over current peak base demands. In all cases, the water quality is generally good, and the current ground-water and surface-water conditions appear favorable for additional development and supply.

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Each cantonment area is served by an adequate transportation system for base operations. Duke Field has an 8,000-foot, fully instrumented runway; Eglin Main has a 12,000-foot, fully instrumented runway used jointly by civilian and military aircraft; and Hurlburt Field has a 9,600-foot, fully instrumented runway. U.S. Highway 98 passes within 1/4 mile of the Hurlburt Field main gate. Eglin Main and Duke Field are served by State Highway 85, which passes within 1/4 mile of their respective main gates. The Eglin AFB deployment area is served by a 7 mile spur from the Louisville and Nashville Railroad along the northern boundary of the base. The spur does not provide direct service to any of the cantonment areas.

Because the three cantonment areas are operated by the Air Force, the existing personnel and logistic support systems would be relatively compatible with the operations of the Hard Mobile Launcher mission.

A variety of support services for Eglin AFB are available, as indicated by the size of the local cities and the availability of on-base housing. Fort Walton Beach is the largest city (population approximately 27,000) in proximity to the base, providing a wide range of goods and services. The on-base housing at Eglin Main and Hurlburt Field is in good condition and

upgrade of housing is planned for the near future. Housing for Duke Field personnel is provided by the Hurlburt Field or Eglin Main housing facilities.

Public Impacts: The increased water demand in support of the Hard Mobile Launcher system is expected to have a minimal effect on the local communities because there are sufficient available water resources in the area.

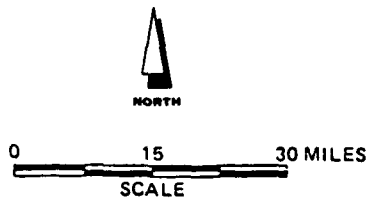
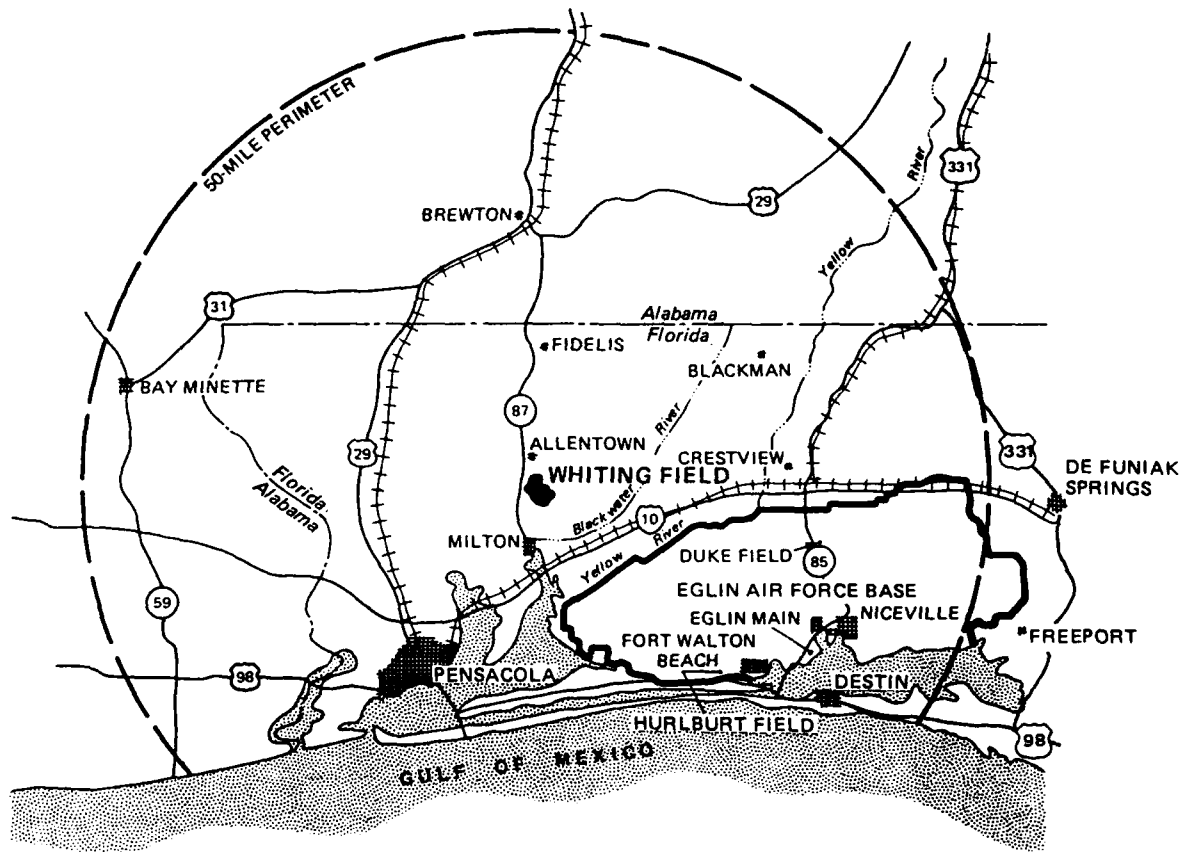
Duke Field, Eglin Main, and Hurlburt Field are contiguous with the Eglin AFB Candidate Deployment Installation. This would eliminate the necessity for travel of Hard Mobile Launchers on public roads, which, in turn, would minimize security and public safety concerns.

With the exception of the Fort Walton Beach and Pensacola areas, the relatively small urban population in the ten-county area surrounding the three cantonment areas of Eglin AFB would provide a limited range of goods and services for the construction and operation of the Hard Mobile Launcher system. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Immigrating workers are likely to have backgrounds similar to those of the resident population, as indicated by the high regional employment in the construction and military sectors. The economic

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diversity of the region, as indicated by the number of export-producing industries in the area, is also better than average. Local governments in the region will be able to capture sizeable tax revenues in the short term to address potential expenditure demands. There is a moderate amount of housing available in the region.





EXPLANATION

- INSTALLATION BOUNDARY
- MAIN HIGHWAYS
- RAILROADS

AREA NARROWING  
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WHITING FIELD NAVAL AIR STATION, FLORIDA

FIGURE  
E-2-2

#### E-2.2 Whiting Field Naval Air Station

After evaluating the alternatives for this Complex in relation to each other, Whiting Field Naval Air Station (NAS) was eliminated from further study as a Main Operating Base. Major influences in this determination were the lack of contiguous deployment area, the distance from the base to the potential deployment area, and limited land available on base for facility expansion.

Whiting Field NAS is located in northwestern Florida, approximately 22 miles northeast of Pensacola (Figure E-2-2). The base is operated by the Navy as their largest flight center for both basic fixed wing and helicopter pilot training. The Whiting Field NAS Main Operating Base would support the Eglin Air Force Base Candidate Deployment Installation.

System Operability: The efficiency of Main Operating Base activities would be enhanced by the proximity to Pensacola (22 miles), the nearest community with a wide range of goods and services. The small potential effective area, as reported in the Mission Compatibility Report, suggests that Whiting Field NAS would provide a low efficiency in maintenance and operations. This efficiency would be further reduced by the distance from the base to the deployment area.

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The apparent ability of the base to provide many support services and facilities for the Hard Mobile Launcher system is implied by the large number (over 3,600) of assigned military personnel. There is, however, no anticipated reduction in operations that might increase the availability of these facilities for the Hard Mobile Launcher mission. On-base land to support Hard Mobile system facilities, including Weapons Storage Areas/Stage Storage Areas, is limited. The base has a total of 3,500 acres, all of which is DoD fee owned.

The base utility infrastructure appears adequate for current operations with potential to expand the present utility capacity to meet future needs. Electrical power is supplied by the Gulf Power Company. Natural gas fuels the central heating plant, although fuel oil is used as a backup during disruptions of the gas supply. The base operates its own waste-water treatment facilities, with a design capacity of 1.05 million gallons-per-day; this is more than adequate to meet current demands. Solid waste is disposed of in an on-base landfill that is more than adequate to meet current requirements and has potential for expansion. The storm drainage system consists of a network of underground drains and open culverts that appears adequate for existing facilities, but the system

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requires continual maintenance to mitigate off-base effects. If additional facilities were constructed, expansion and upgrading of the system would be required. Sufficient ground-water supplies are provided through a series of on-base wells. Ground-water and surface-water supplies are available via direct development for future requirements, although, in the latter case, high iron content and low pH would require that the water be treated prior to use.

Whiting Field NAS has a good transportation system. The base has both a north and a south airfield, each of which has two fully instrumented runways, each 6,000 feet long. The base has a rail spur that connects to the Louisville and Nashville Railroad at the city of Milton; however, the spur is currently not in service and portions of the track have been proposed for removal. State Highway 87 and Interstate 10 are located approximately 2 and 11 miles from the base, respectively. Each is accessible by two- and four-lane county roads.

Because Whiting Field NAS is a Naval training center, the existing personnel and logistic support systems would need to be augmented to become compatible with the Hard Mobile Launcher mission.

A variety of support services for Whiting Field NAS are available as indicated by the size of the support

community, its proximity to the base, and the availability of housing. Pensacola (population over 57,000), located approximately 22 miles to the southwest, can provide a wide range of goods and services. On-base housing is available, although additional housing units would be required to accommodate the Hard Mobile Launcher system personnel. The availability of housing in Pensacola is good.

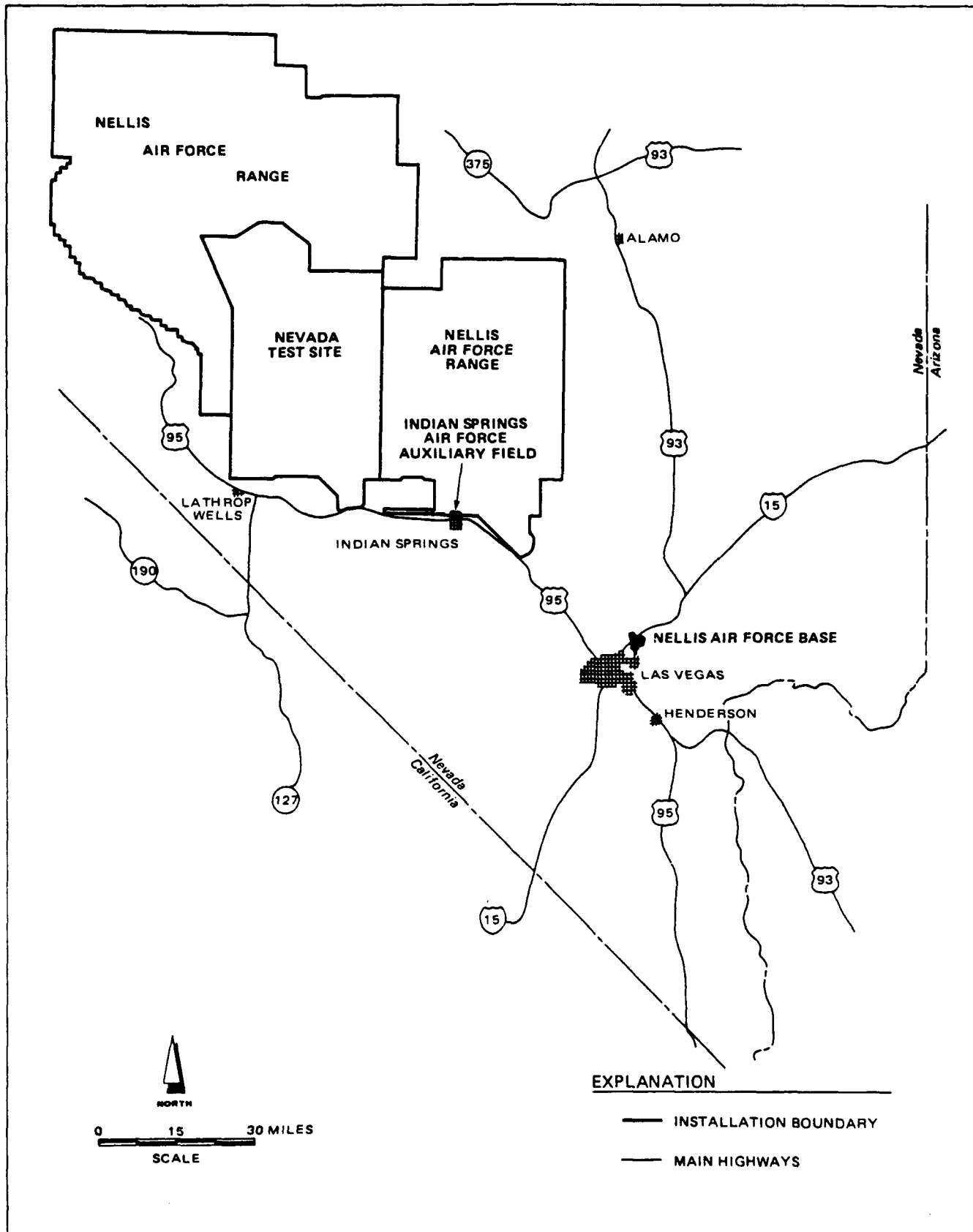
Public Impacts: The increased water demand in support of deployment of the Hard Mobile Launcher system is expected to have a minimal effect on the local communities because there are sufficient available surface- and ground-water resources in the region.

Public safety and security concerns are increased because the distance (40 miles) from the Main Operating Base to the deployment area would require travel of Hard Mobile Launchers on public roads.

Although the cities of Pensacola and Fort Walton Beach can provide a wide range of goods and services, the outlying areas have limited goods and services for support of the system. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Immigrating workers are likely to have backgrounds similar to those of the resident population, as indicated by the high

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regional employment in the construction and military sectors. The number of export-producing industries in the region indicates good economic diversity in the area. The local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. The availability of housing in the Pensacola and Fort Walton Beach communities is good.



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NEVADA COMPLEX

FIGURE  
E-3

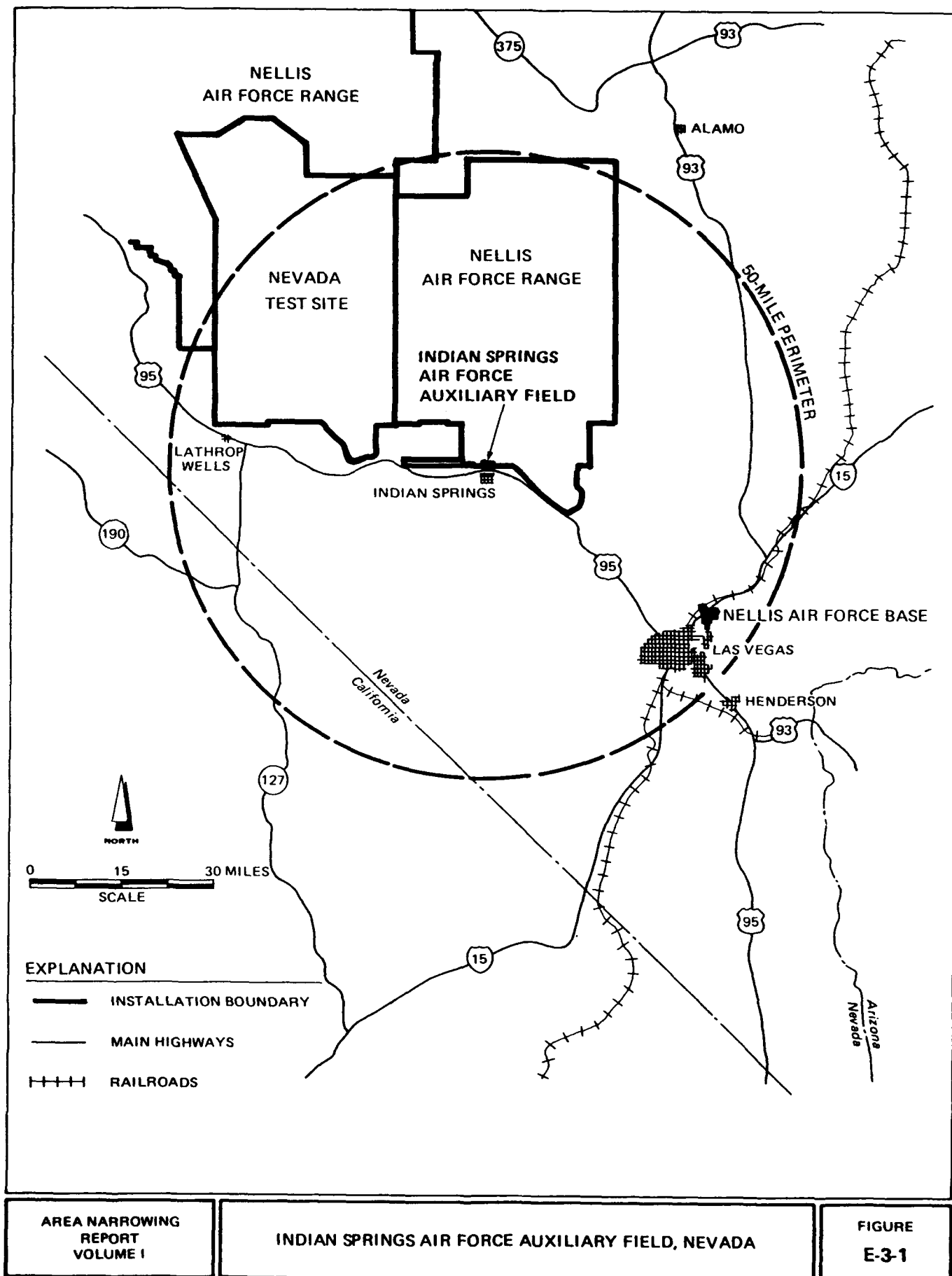
E-3 Nevada Complex

Following application of Main Operating Base Exclusionary Criteria and Deployment Installation Evaluative Criteria, there remained two Candidate Main Operating Bases within the Nevada Complex. These bases are: Indian Springs Air Force Auxiliary Field and Nellis Air Force Base (Figure E-3).

Subsequent application of Main Operating Base Evaluative Criteria resulted in the determination that neither base performed significantly better than the other with respect to all the criteria, and therefore both remain for further study. However, no determination is made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.

The following sections elaborate on the performance of each Candidate Main Operating Base with regard to the Main Operating Base Evaluative Criteria.





**E-3.1 Indian Springs Air Force Auxiliary Field, Nevada**

After evaluating the alternatives for this Complex in relation to each other, Indian Springs Air Force Auxiliary Field (AFAF) remains for further, more detailed study as a Main Operating Base. The Main Operating Base has favorable characteristics for Hard Mobile Launcher deployment, as indicated by the relatively short travel distance to the deployment areas, the abundant land available for facilities expansion, the good highway access to the base, and the large effective area contiguous to the base.

Indian Springs AFAF is located in southern Nevada, 38 miles northwest of Las Vegas (Figure E-3-1). The base adjoins the southern boundary of the Nellis South Range. The base is presently used for gunnery range maintenance support for the Nellis Air Force Range, as well as an emergency and practice airfield in support of Nellis Air Force Base. A Main Operating Base at the Indian Springs AFAF could support the Nevada Complex.

System Operability: The operational efficiency of Indian Springs AFAF as a Main Operating Base for Hard Mobile Launcher deployment would be degraded by the travel distance (38 miles) to the nearest community (Las Vegas) that would be able to provide a wide range of goods and services to the base. The town of Indian

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Springs, which lies adjacent to Indian Springs AFAF, has minimal support services and a small population (approximately 1,500). The large potential effective area, as reported in the Mission Compatibility Report, would suggest a high efficiency of maintenance and operations at Indian Springs AFAF. This efficiency would be further enhanced because the base is contiguous with the deployment area. The base support capability with regard to existing on-base services and facilities is minimal, as implied by the small number (approximately 230) of military personnel on base. The majority of support services and facilities for Indian Springs AFAF personnel are located at Nellis Air Force Base. No reduction in the mission at Indian Springs AFAF is anticipated that would make the existing facilities more available for the Hard Mobile mission. Because the base is contiguous with the Nellis South Range, there is abundant land to support Hard Mobile Launcher system facilities, including Weapons Storage Area/Stage Storage Area facilities. All on-base land is DoD fee owned or withdrawn for military use.

The utility infrastructure at Indian Springs AFAF is adequate for current base operations, but would require expansion to accommodate the Hard Mobile Launcher system. Electrical power is supplied by the Nevada Power Company, and surplus capacity is available.

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Heating is provided by diesel fuel transported from Nellis Air Force Base. There are no known natural gas pipelines or distribution facilities extending to the base. Waste water at Indian Springs AFAF is processed by a twin-lagoon Imhoff disposal system. The system would require expansion to support the Hard Mobile Launcher mission. Solid wastes are disposed of under contract in the Las Vegas area. The base storm drainage system is minimal and appears inadequate for present facilities, as indicated by historic flooding on base. It is uncertain whether there is sufficient ground water available for the Hard Mobile Launcher system through direct development and/or purchase of existing supplies. The ground-water basin from which the base derives its water is in overdraft, and there are no local surface-water sources. Water quality may be poor in some areas and water may require more than conventional treatment prior to domestic use. Expansion of the existing water-supply facilities would be required.

The base has a limited transportation system. The airfield has a 7,650-foot runway with limited instrumentation. The nearest 10,000-foot runway is located at Nellis Air Force Base. The road system for accessing the base is adequate; U.S. Highway 95 bisects the base, separating its small housing area from the

rest of the cantonment area. Indian Springs AFAF does not have a rail siding; the nearest military rail sidings are located at Nellis Air Force Base.

Because the Auxiliary Field is operated by the Air Force, the existing personnel and logistic support systems would be relatively compatible with the Hard Mobile Launcher mission. Personnel assigned to the field are supported by Nellis Air Force Base.

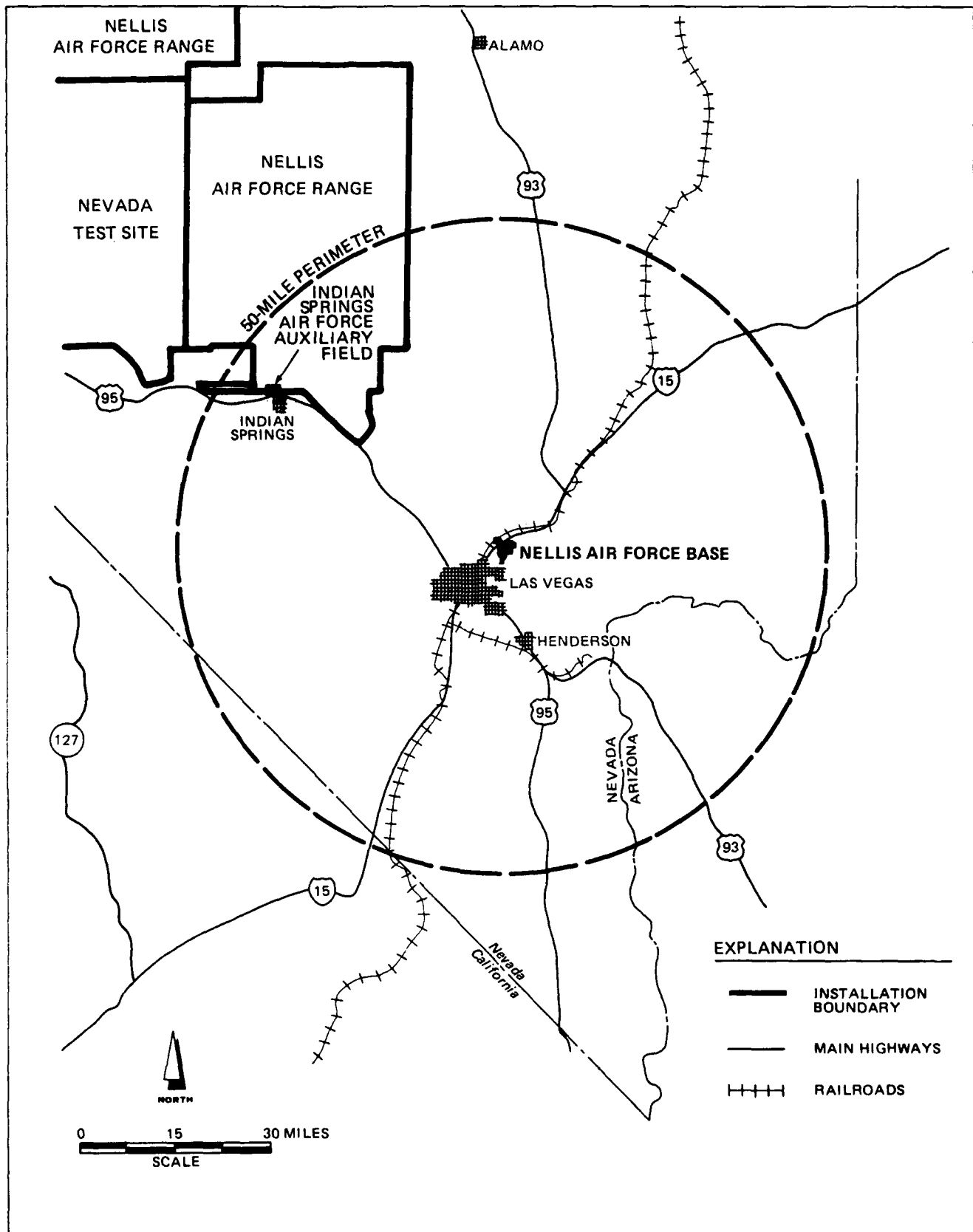
Indian Springs AFAF has very limited support services and housing. The nearest community capable of providing adequate support services for the base personnel is Las Vegas. There are few available family housing units on base and the small town of Indian Springs has very limited housing.

Public Impacts: Increased water demand in support of Hard Mobile Launcher system deployment could affect the existing water supply system in the support community. Present surface-water supplies are being used near their capacity and additional development of ground-water supplies is unlikely.

Security and public safety concerns would be minimized at Indian Springs AFAF because the base is contiguous with the deployment area. This minimizes the need for travel of Hard Mobile Launchers on public highways.

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The four-county region of influence containing the base and its associated Candidate Deployment Installations has a relatively small urban population, the majority of which is located in the Las Vegas area. Although the Las Vegas area can provide a wide range of goods and services, the outlying areas provide very limited goods and services for base personnel. Nonagricultural employment in the region is relatively low, which increases the likelihood of immigration of project-related workers. There are relatively few people employed in the construction and military sectors in the area, which implies that new workers are likely to have backgrounds dissimilar to those of the resident population. The economic diversity of the region is moderate based on the number of export-producing industries in the area. Local governments in the region should be able to capture some tax revenues in the short term to address potential expenditure demands. Although the availability of housing in the Las Vegas support community is good, housing availability elsewhere in the region is relatively low.



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NELLIS AIR FORCE BASE, NEVADA

FIGURE  
E-3-2

### E-3.2 Nellis Air Force Base, Nevada

After evaluating the alternatives for this Complex in relation to each other, Nellis Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. Nellis AFB offers an established Air Force support infrastructure close to a large metropolitan area that can provide a wide range of services. In addition, the base has a good transportation network.

Nellis AFB is located in southeastern Nevada, approximately 6 miles northeast of Las Vegas (Figure E-3-2). The base is operated by the Air Force Tactical Air Command. A Main Operating Base at Nellis AFB could support the Nevada Complex.

System Operability: The operational efficiency of Nellis AFB as a Main Operating Base for Hard Mobile Launcher deployment would be enhanced by its proximity (6 miles) to Las Vegas, the nearest community that could provide a wide range of goods and services to the base. The large potential effective area, as reported in the Mission Compatibility Report, would suggest a high efficiency of maintenance and operations at Nellis AFB. This efficiency, however, would be degraded by the base's asymmetrical location with respect to, and its long distance from, the deployment areas. The



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support capability of Nellis AFB with regard to existing on-base services and facilities is good, as implied by the large number (approximately 10,770) of assigned military personnel. There are, however, no anticipated mission changes that would make the existing facilities more available for the Hard Mobile Launcher mission. Sufficient land is available on base to support Hard Mobile Launcher facilities, including Weapons Storage Area/Stage Storage Area facilities. On-base land is 40 percent DoD fee owned and 59 percent withdrawn for military use.

The utility infrastructure at Nellis AFB appears adequate for current base operations, with some potential for expansion. Electrical power for the base is supplied by the Nevada Power Company. The existing capacity is adequate for present base needs. The Western Area Power Administration is scheduled to begin its service in 1989, adding to the potential source of power in the area. Natural gas is supplied by the Southwest Gas Corporation and fuel oil is supplied by direct pipeline from CAL-NEV. The base heating systems have some excess capacity. The installation's principal waste-water treatment facilities are operated by the Clark County Sanitation District, with capacity to accommodate additional needs. The existing landfill has limited capacity but another landfill site is in

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preparation and will provide 9 more years of service. The present base storm drainage system appears inadequate to handle severe storms, which have occasionally shut down base runway operations. Water availability for deployment of the Hard Mobile Launcher system is uncertain, because the ground-water basin serving the base is currently in overdraft and present demand for surface-water supplies is nearing capacity. Water quality, however, is good.

Nellis AFB has a good transportation system. The airfield has two instrumented runways longer than 10,000 feet. The regional roadway system is adequate for Hard Mobile Launcher deployment needs. Principal access to the base is provided by U.S. Highway 93 and Interstate Highway 15. Nellis AFB is served by a rail spur from the Union Pacific Railroad, which enters the base from the northeast.

Because the base is operated by the Air Force, the existing personnel and logistic support systems would be relatively compatible with the Hard Mobile Launcher mission.

A variety of support services for Nellis AFB is available, as indicated by the size of the support community, its proximity to the base, and the availability of housing. Las Vegas, with a population

of about 165,000, is the nearest community capable of providing a wide range of public services. Although some on-base housing is available, additional housing would be required to support the Hard Mobile Launcher system. The availability of off-base housing is very good.

Public Impacts: The increased water demands of the Hard Mobile Launcher system could affect Las Vegas. Present surface-water supplies are being used near capacity and additional development of ground water supplies is unlikely.

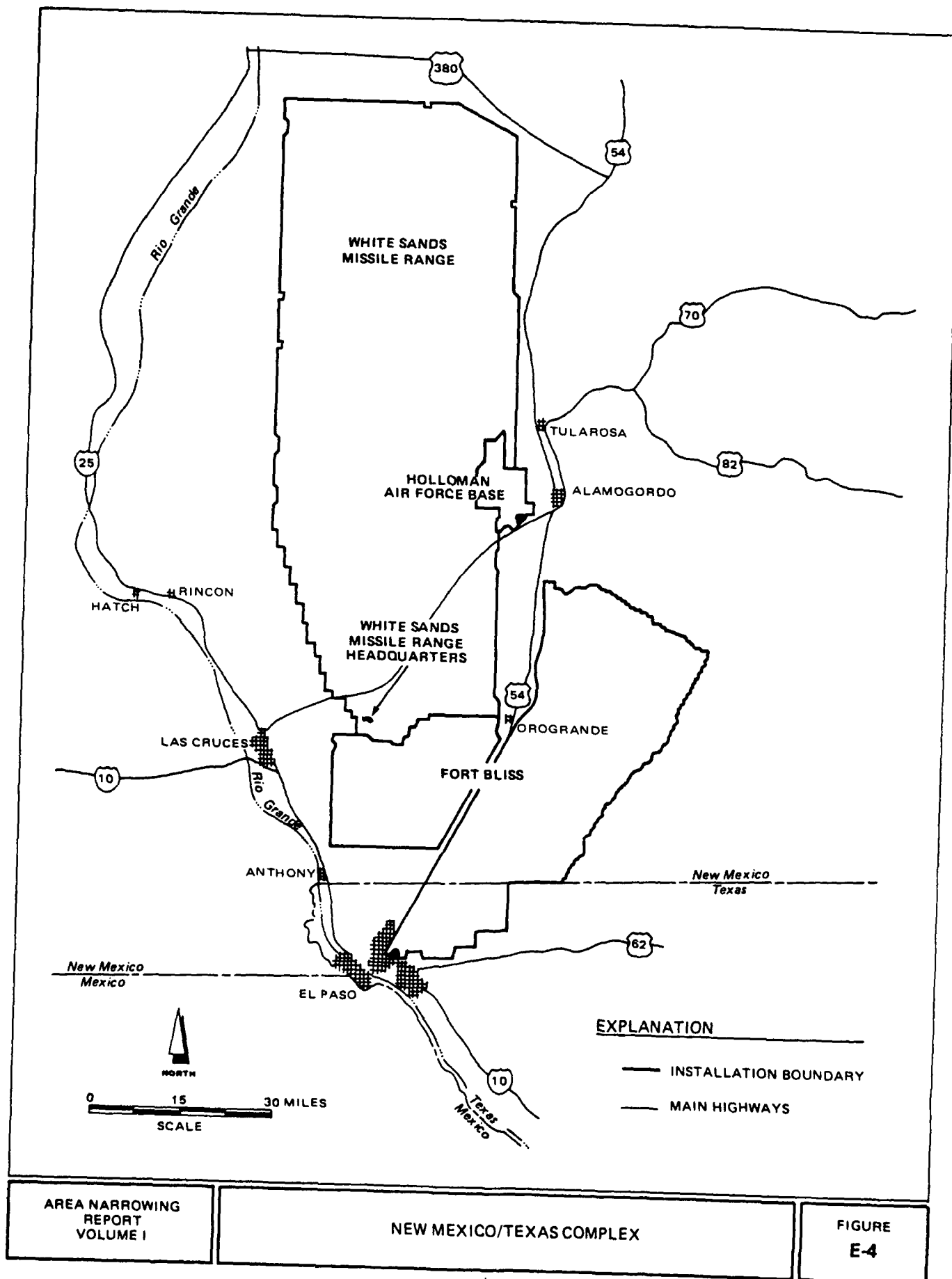
Nellis AFB is a long distance (37 miles) from its deployment area. Security and public safety concerns are increased due to the distance Hard Mobile Launchers would have to travel on public roads.

The city of Las Vegas and surrounding communities can provide a wide range of goods and services, but the outlying areas within the region have very limited goods and services. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is relatively low, which implies that immigrating workers are likely to have backgrounds dissimilar to those of the resident population. The number of

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export-producing industries in the area indicates good economic diversity in the region. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the region is somewhat limited, but the availability of housing in the Nellis AFB vicinity is good. Many of the regional disadvantages should be overcome to a large extent by the proximity of Las Vegas.

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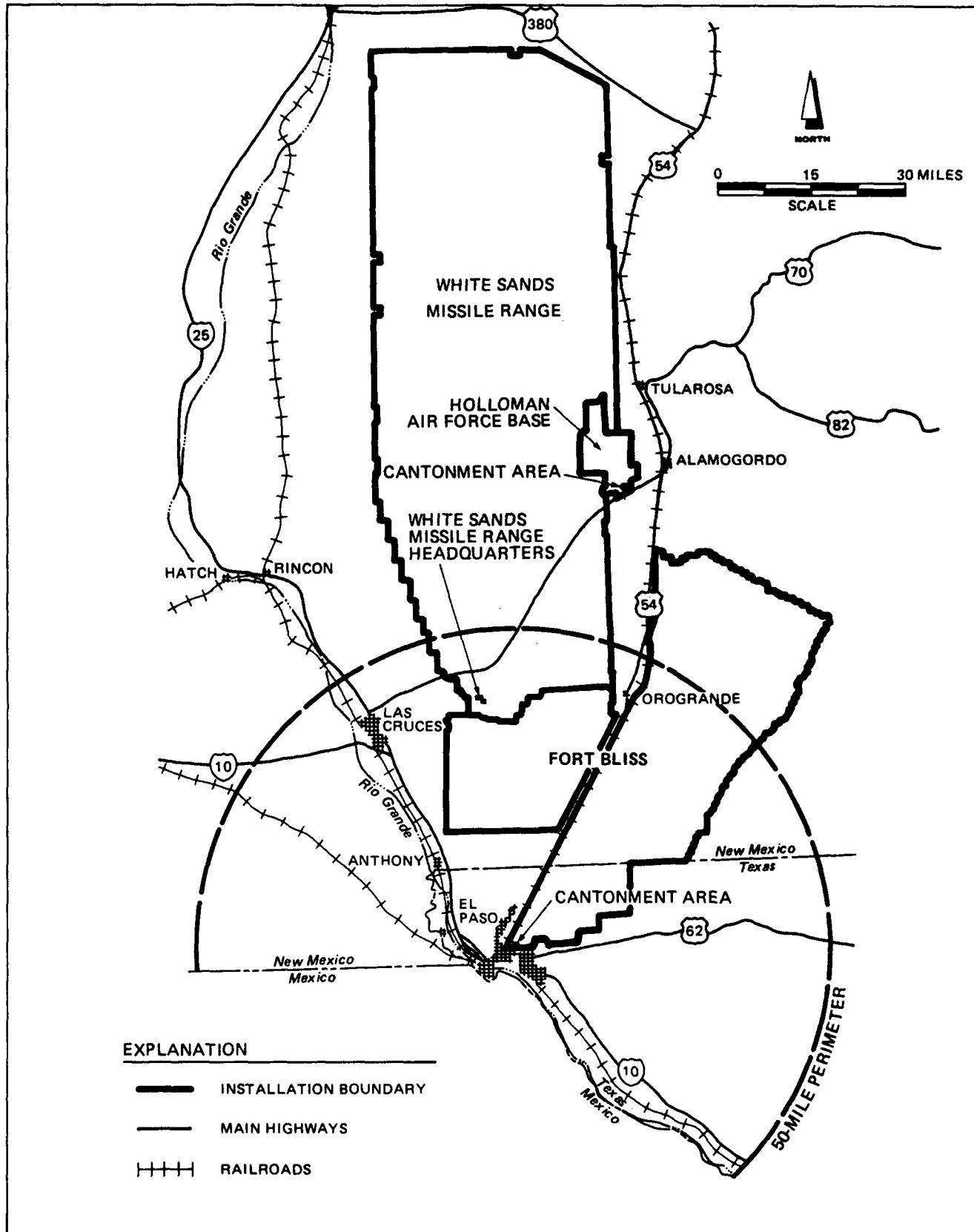
E-4 New Mexico/Texas Complex

Following application of Main Operating Base Exclusionary Criteria and Deployment Installation Evaluative Criteria, there remained three Candidate Main Operating Bases within the New Mexico/Texas, Complex. These bases are: Fort Bliss, Holloman Air Force Base, and White Sands Missile Range Headquarters (Figure E-4).

Subsequent application of Main Operating Base Evaluative Criteria resulted in the determination that overall there is no significant difference among the bases with regard to the criteria, and therefore all remain as Candidate Main Operating Bases. However, no determination has been made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.

The following sections elaborate on the performance of each Candidate Main Operating Base with regard to the Main Operating Base Evaluative Criteria.

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FORT BLISS, TEXAS

FIGURE  
E-4.1

E-70  
SENSITIVE

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E-4.1 Fort Bliss, Texas

After evaluating the alternatives for this Complex in relation to each other, Fort Bliss remains for further, more detailed study as a Main Operating Base. The base is close to a large support community, has land available for on-base facilities expansion, has a good transportation system, and has a favorable utility infrastructure.

Fort Bliss is an Army base located in the westernmost portion of Texas, immediately adjacent to the eastern limits of El Paso, Texas. The Fort Bliss range extends northeast from El Paso into southeastern New Mexico (Figure E-4-1). The base is presently used as an air defense weapons training center. A Main Operating Base at Fort Bliss would support all the Candidate Deployment Installations of the New Mexico/Texas Complex.

System Operability: The operational efficiency of Fort Bliss as a Main Operating Base would be enhanced by the proximity of El Paso, the support community. This area can provide a wide range of goods and services. The large potential effective area, as reported in the Mission Compatibility Report, would suggest that Fort Bliss could support efficient maintenance and operations. Although Fort Bliss is contiguous to the



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deployment areas, some efficiency is lost because of its non-central location with respect to the deployment area. The large military population (approximately 22,000) implies an apparent ability of the base to provide many support services and facilities for the Hard Mobile Launcher system. However, no mission changes are expected that would make these services and facilities more available for the Hard Mobile mission. The additional land available for expansion of facilities, including Weapons Storage Area/Stage Storage Area facilities, is sufficient because the Main Operating Base cantonment area is contiguous with the Fort Bliss range. Currently, 94 percent of the available land on the installation is either DoD fee owned or land withdrawn for military use.

The utility infrastructure at Fort Bliss appears adequate for current base operations and has a good potential for expansion. Electrical power is supplied by the El Paso Electric Company, and capacity appears more than adequate to handle present base needs. Heating is provided by the El Paso Natural Gas Company; current use is 44 percent under maximum capacity. The El Paso waste-water treatment plant that serves the base has a 1.85 million gallons-per-day excess capacity. The on-base landfill site currently used for solid waste disposal has capacity for 30 years before

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another site will be required. The base storm drainage system may not be adequate to support expanded facilities without installation of additional structures. It is questionable whether sufficient ground water would be available for project demands. The base is located in a state declared ground-water basin where ground-water use and the associated issue of overdrafting are currently in litigation. Ground water may be of poor quality in some areas and may require more than conventional treatment prior to domestic use. Purchase of surface-water rights from the Rio Grande River may be possible.

Fort Bliss has a complete transportation system. The base's 13,555-foot, fully instrumented runway, which receives airlifted materials and personnel, is within 3 miles of El Paso International Airport. An on-base rail spur connects with the Southern Pacific Railroad. Access to the base is provided by Interstate Highways 10 and 25, which are less than 1 and 10 miles from the base, respectively. The accessibility of these transportation options provides very favorable flexibility for logistical support and personnel transport.

Because Fort Bliss is an Army installation, the existing personnel and logistic support systems would

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need to be augmented to meet Air Force operational needs.

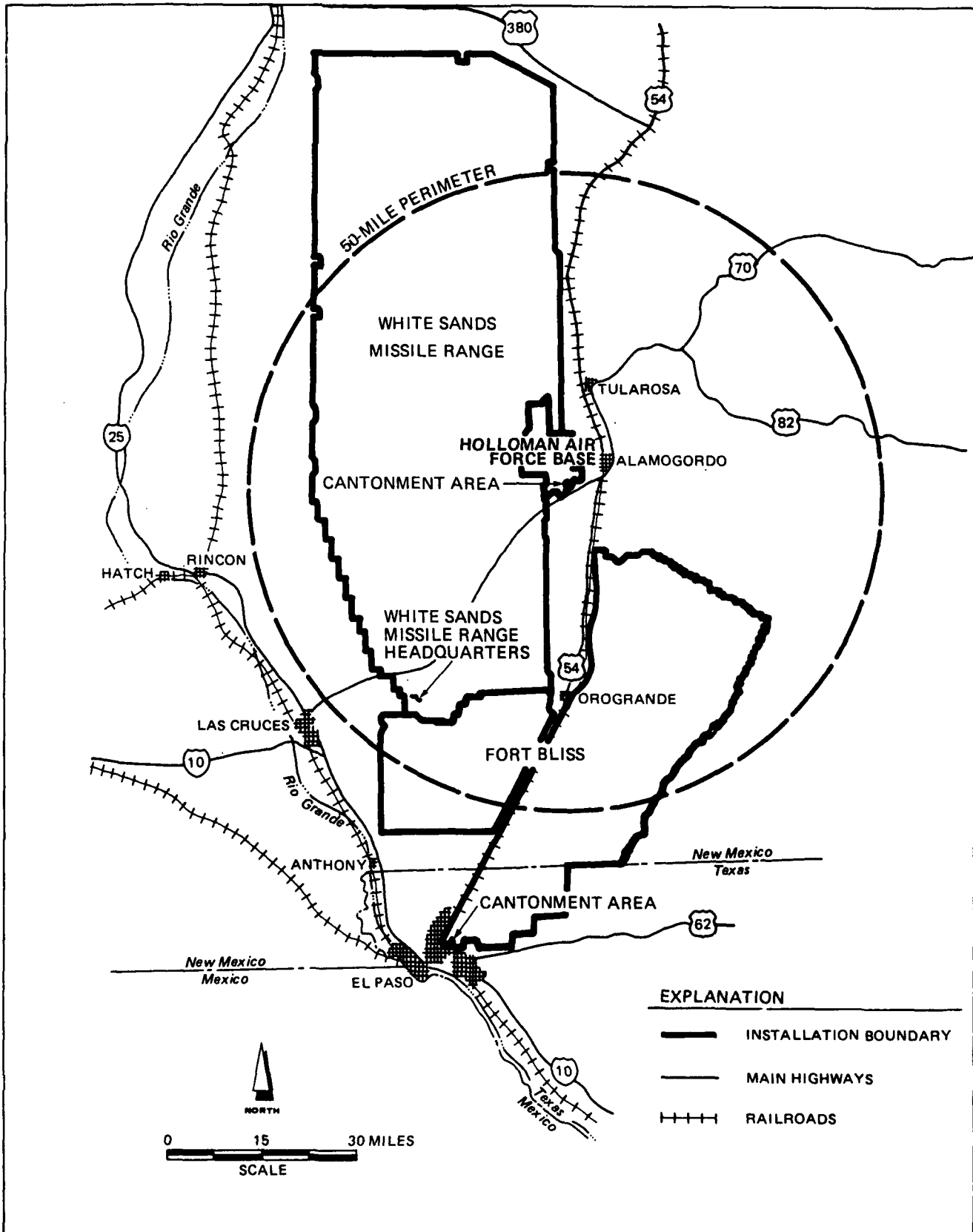
Fort Bliss has good support services, as indicated by the size and proximity of the nearest population center and the availability of housing on and adjacent to the base. The Fort Bliss cantonment area is adjacent to El Paso, which has a population of approximately 454,000, could provide a wide range of support services. Although some on-base housing may be available, additional housing would be required to accommodate the Hard Mobile system personnel and their dependents.

Public Impacts: The increased water demand in support of the Hard Mobile Launcher system could affect the local communities. The communities are in a state declared ground-water basin that is currently in overdraft, and ground-water use is in litigation. New water sources may need to be developed or existing water rights transferred/purchased to meet the deployment and operational needs of the Hard Mobile Launcher system.

The Main Operating Base is contiguous with the Candidate Deployment Installations, which eliminates the need for travel of Hard Mobile Launchers on public highways. This would minimize concerns about security and public safety.

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The four-county region of influence surrounding the Main Operating Base and its associated Candidate Deployment Installations has a relatively small urban population, the majority of which is located in the El Paso area. Although the El Paso and Las Cruces areas can provide a wide range of goods and services, the outlying areas of the region can provide only limited goods and services. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. In addition, regional employment in the construction and military sectors is moderate, which implies that immigrating workers are likely to have backgrounds similar to those of the resident population. The economic diversity of the region is moderate, based on the number of export-producing industries in the area. Local governments in the region should be able to capture tax revenues in the short term to address potential expenditure demands. Although the availability of housing in the El Paso and Las Cruces communities is good, housing availability elsewhere in the region is relatively limited.



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HOLLOMAN AIR FORCE BASE, NEW MEXICO

FIGURE  
E-4-2

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**E-4.2 Holloman Air Force Base, New Mexico**

After evaluating the alternatives for this Complex in relation to each other, Holloman Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. The base has a complete transportation system and a good utility infrastructure. The base is contiguous with, and centrally located to, its associated Candidate Deployment Installations, and it is an Air Force Base.

Holloman AFB is located in south-central New Mexico, approximately 5 miles from Alamogordo, within 15 miles of Tularosa, and about 90 miles north of El Paso, Texas (Figure E-4-2). The base adjoins White Sands Missile Range along portions of its west, north, and east boundaries. Holloman AFB is presently operated by the Air Force Tactical Air Command and is used for tactical fighter training and tactical fighter combat preparedness, and includes a combat support group. A Main Operating Base located at Holloman AFB could support all three Candidate Deployment Installations in the New Mexico/Texas Complex.

System Operability: The operational efficiency of Holloman AFB as a Main Operating Base would be enhanced by the short distance (5 miles) to Alamogordo, the nearest community that could provide goods and services

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to the base. The large potential effective area, as reported in the Mission Compatibility Report, suggests that Holloman AFB could provide efficient maintenance and operations. This efficiency would be further enhanced because the base is contiguous to, and centrally located with respect to all deployment areas. The presence of a large number of military personnel on base (approximately 6,580) implies the apparent ability of the base to provide a number of support services and facilities. There are, however, no anticipated mission changes that would make these facilities and services more available for the Hard Mobile Launcher mission. Within the limits of the Holloman AFB cantonment area, there is no land available for new Weapons Storage Area/Stage Storage Area facilities; however, there is adequate land available for such facilities on the outlying areas of the base. Ninety-three percent of available on-base land is DoD fee owned or withdrawn for military use.

The base utility infrastructure appears adequate for current operations, with some potential for expansion to meet future requirements. Electrical power is supplied by the El Paso Electric Company, with additional electrical power for 600 base housing units supplied by the Otero Electric Company. The capacity of the electrical supply system appears more than

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adequate for present base needs. Natural gas is supplied by the Gas Company of New Mexico. The system has adequate capacity to handle present base needs and the potential to handle increased demands. Holloman AFB is served by a 2.2 million gallon-per-day waste-water treatment plant that has a 47 percent excess capacity over its present demand. Solid wastes are disposed of in a 45-acre, on-base sanitary landfill site; an additional area has been set aside for future use. The storm drainage system is generally adequate for existing facilities, although some flooding in the base housing area has occurred. Ground water for the Hard Mobile Launcher system may be obtained through appropriation or purchase from existing supplies. However, development of additional ground-water or surface-water supplies is questionable because the state declared ground-water basin is already being overdrafted and current surface-water supplies may not be expandable. The quality of the surface-water sources is good, but ground water may be of poor quality and, in some areas, water may require more than conventional treatment prior to domestic use.

Holloman AFB has a complete transportation system. The main airfield has a 12,134-foot, fully instrumented runway with an adjacent 10,578-foot secondary runway. A portion of the south base boundary borders U.S. Highway



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70 and the installation's main entrance is located about 5 miles west of U.S. Highway 54. A rail spur of the Southern Pacific Railroad traverses the main cantonment area.

Because Holloman is an Air Force base, the existing personnel and logistic support systems would be relatively compatible with the Hard Mobile Launcher mission.

The support services at Holloman AFB are generally good, as indicated by the size of the support community and the housing availability. The city of Alamogordo (population about 30,000) is the nearest community capable of providing a wide range of goods and services for base personnel. There are a large number of on-base housing units, and the present occupancy rate is between 88 and 90 percent.

Public Impacts: Increased water demand in support of Hard Mobile Launcher system deployment could affect the local community. The ground-water basin, in which all the nearby communities are located, is presently in overdraft and has been declared by the state. Ground water is of poor quality in some areas, requiring more than conventional treatment prior to domestic use. Alamogordo's ability to meet peak water demands is marginal. Expansion of the surface-water supplies that

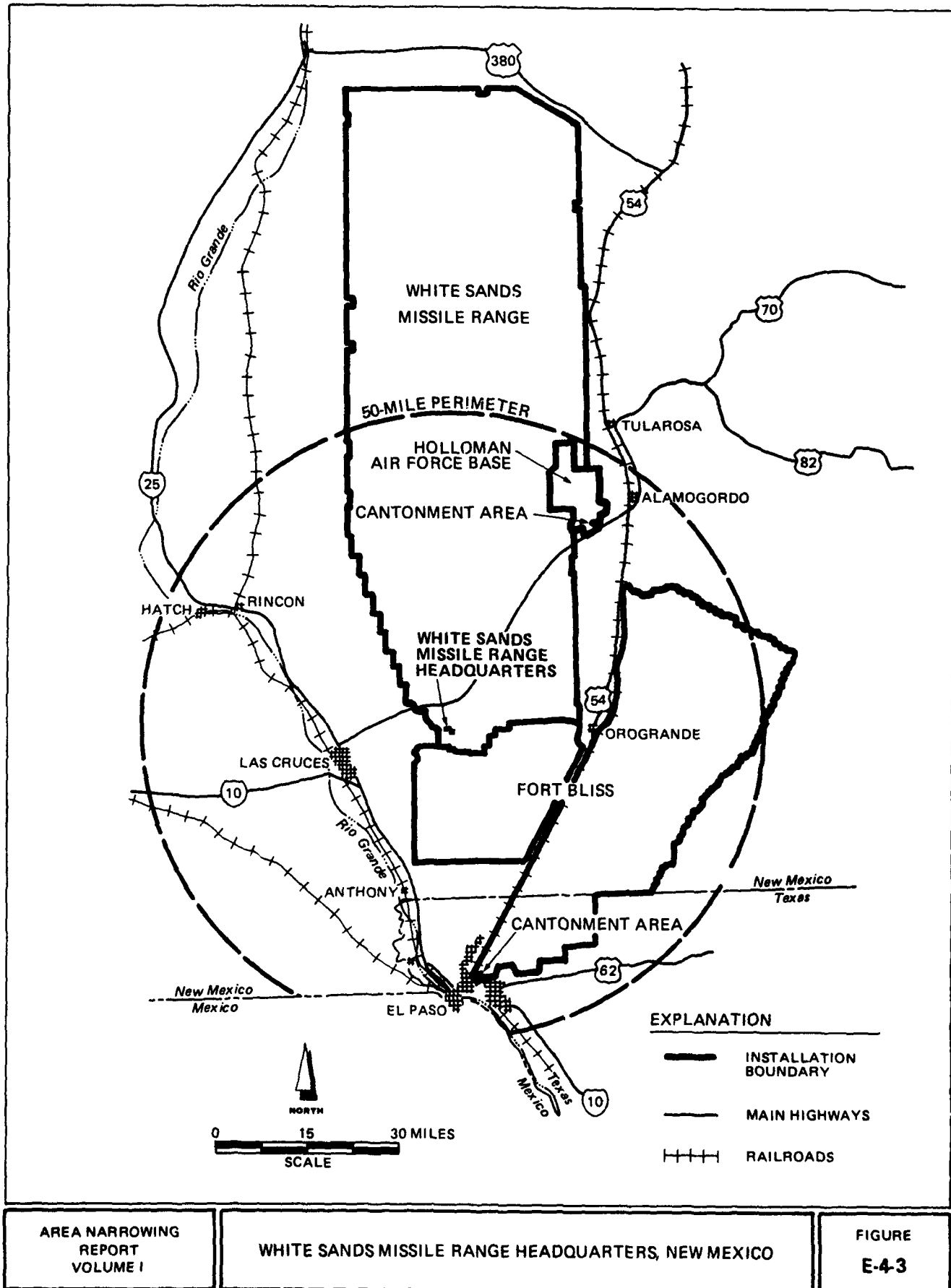
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provide water to Alamogordo and Holloman AFB is unlikely.

Public safety and security concerns are minimized at Holloman AFB because the base is contiguous with its Candidate Deployment Installations, minimizing the need for Hard Mobile Launchers to travel on public roads.

The relatively small urban population in the five-county area surrounding the base can provide only limited goods and services. As a result, deployment of the Hard Mobile Launcher system could raise social and economic concerns in the region. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is also relatively low, which implies that immigrating workers are likely to have backgrounds dissimilar to those of the resident population. The number of export-producing industries in the area indicates low economic diversity in the region. Local governments in the region may not be able to capture tax revenues in the short term to address potential expenditure demands. There are relatively few vacant housing units in the surrounding region to accommodate system personnel.

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E-4.3 White Sands Missile Range Headquarters, New Mexico

After evaluating the alternatives for this Complex in relation to each other, White Sands Missile Range Headquarters (HDQR) remains for more detailed study as a Main Operating Base. The base has abundant land available for additional facilities, it has a good utility infrastructure, and it is contiguous with the deployment areas.

White Sands Missile Range HDQR is located in south-central New Mexico, 23 road miles east of Las Cruces and about 45 road miles north of El Paso, Texas (Figure E-4-3). White Sands Missile Range HDQR is in the southern portion of the range. The base is operated by the Army and is presently used for testing missiles for various branches of the Armed Services. A Main Operating Base at White Sands Missile Range HDQR would support the New Mexico/Texas Complex.

System Operability: The efficiency of Main Operating Base activities at the Headquarters area would be enhanced by the base's proximity to Las Cruces (23 road miles), the nearest community that could provide a wide range of goods and services to the base. The large potential effective area, as reported in the Mission Compatibility Report, suggests that White Sands Missile Range HDQR could provide efficient maintenance and

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operations. Efficiency would be further enhanced because the base is contiguous to, and centrally located with respect to, all deployment areas. There are about 1,430 military personnel on base, which implies that the installation is able to provide some support services and facilities. No mission change is expected that would make these facilities more available for a Hard Mobile Launcher mission. Sufficient land appears available for constructing additional support facilities, including new Weapons Storage Area/Stage Storage Area facilities. Available land in the vicinity of the HDQR area is permanently withdrawn for military use.

The utility infrastructure at White Sands Missile Range HDQR appears adequate for current base operations, with some potential for expansion. Electrical power is supplied by the El Paso Electric Company, with approximately 180 percent expansion potential, using existing supply and substation facilities. Natural gas is supplied by the El Paso Natural Gas Company and is the primary heating fuel, although some heating oil and propane are still used in remote range support areas. The natural gas supply capacity is adequate for current demands, but may require expansion to accommodate an additional mission. The on-base waste-water treatment plant has a one million gallons-per-day design

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capacity. The 1980 peak monthly-average use was 600,000 gallons-per-day, which means that there is 40 percent available capacity. The existing landfill is adequate and can handle additional demand with minor changes. The storm drainage system can handle considerable additional flow; flash flooding of the HDQR area, which has occurred in the past, has been eliminated by improved diking. Although ground water may be available through appropriation and/or purchase, overdrafting of the ground-water basin is already occurring and the basin has been declared by the state. There are no local surface-water supplies. Existing ground water may be of poor quality in some areas and may require more than conventional treatment prior to domestic use.

White Sands Missile Range HDQR has a limited transportation system. The HDQR area airfield has a 6,125-foot, uninstrumented runway; the nearest 10,000-foot runways are at El Paso International Airport and Biggs Army Airfield, approximately 45 miles south of the HDQR area. The roadway system is adequate, with U.S. Highway 70 running through the range and passing approximately 2 miles north of the HDQR area. The nearest rail sidings are 24 and 25 miles from the HDQR area at Orogrande and Las Cruces, respectively. The Orogrande siding is adjacent to the White Sands Missile Range.

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Because White Sands is an Army installation, the existing personnel and logistic support systems would need to be augmented for compatibility with Air Force operations.

White Sands Missile Range HDQR has good support services, as indicated by the size and proximity of the support community and the availability of housing. Las Cruces (population about 55,000) is the nearest community capable of providing a wide range of goods and services. Although some on-base housing may be available, additional housing would be required. Off-base housing is available in Las Cruces.

Public Impacts: Water demands resulting from Hard Mobile Launcher system deployment could have an effect on the local community supplies because of present overdrafting of the state declared ground-water basin and the limited supply of surface water.

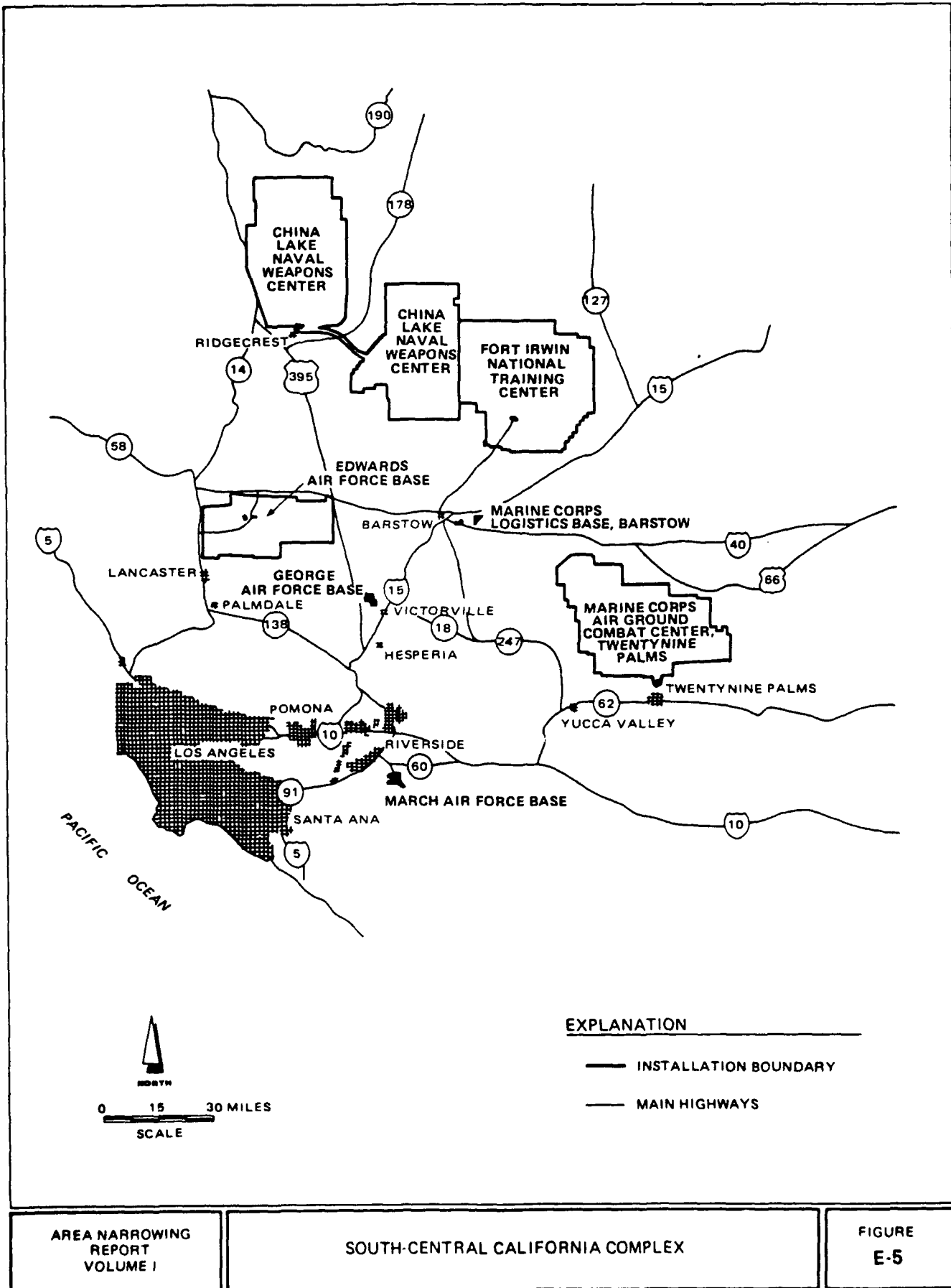
The Candidate Deployment Installations are contiguous with the Main Operating Base, which eliminates the potential for travel of the Hard Mobile Launchers on public highways. This would minimize security and public safety concerns.

The six-county, two-state (Texas and New Mexico) region of influence containing the base and its associated

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Candidate Deployment Installations has a relatively small urban population, the majority of which is principally located in the El Paso area. Although the El Paso and Las Cruces areas can provide a wide range of goods and services, the outlying region may provide only limited goods and services. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors implies that immigrating workers are likely to have backgrounds similar to those of the resident population. The number of export-producing industries in the area indicates good economic diversity in the region. Local governments in the region have a relatively low ability to capture tax revenues in the short term to address potential expenditure demands. A moderate amount of housing is available in the Las Cruces and El Paso communities; however, elsewhere in the region housing availability is limited.





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E-5 South-Central California Complex

Following application of Main Operating Base Exclusionary Criteria and Deployment Installation Evaluative Criteria, there remained six Candidate Main Operating Bases within the South-Central California Complex. These bases are: China Lake Naval Weapons Center; Edwards Air Force Base; Fort Irwin National Training Center; George Air Force Base; Marine Corps Air Ground Combat Center, Twentynine Palms; and Marine Corps Logistics Base, Barstow; (Figure E-5).

Subsequent application of Main Operating Base Evaluative Criteria resulted in the elimination of all bases except Edwards Air Force Base and Fort Irwin National Training Center as Candidate Main Operating Bases. However, no determination has been made at this time regarding the overall advisability of using these installations to support an Air Force Strategic Air Command mission.

The major influences in the determination to eliminate the four bases are identified below.

China Lake Naval Weapons Center - base is asymmetrically located with respect to the potential deployment area and has limited support services available in the immediate vicinity.

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George Air Force Base - lacks contiguous deployment area, has limited land available on base for facility expansion, and has limited support services available in the immediate vicinity.

Marine Corps Air Ground Combat Center, Twentynine Palms - has limited support services in the immediate vicinity and limited transportation support, and is asymmetrically located with respect to the potential deployment areas.

Marine Corps Logistics Base, Barstow - lack of contiguous deployment area, limited land available on base for facility expansion, lack of air transportation support, and limited support services available in the immediate vicinity.

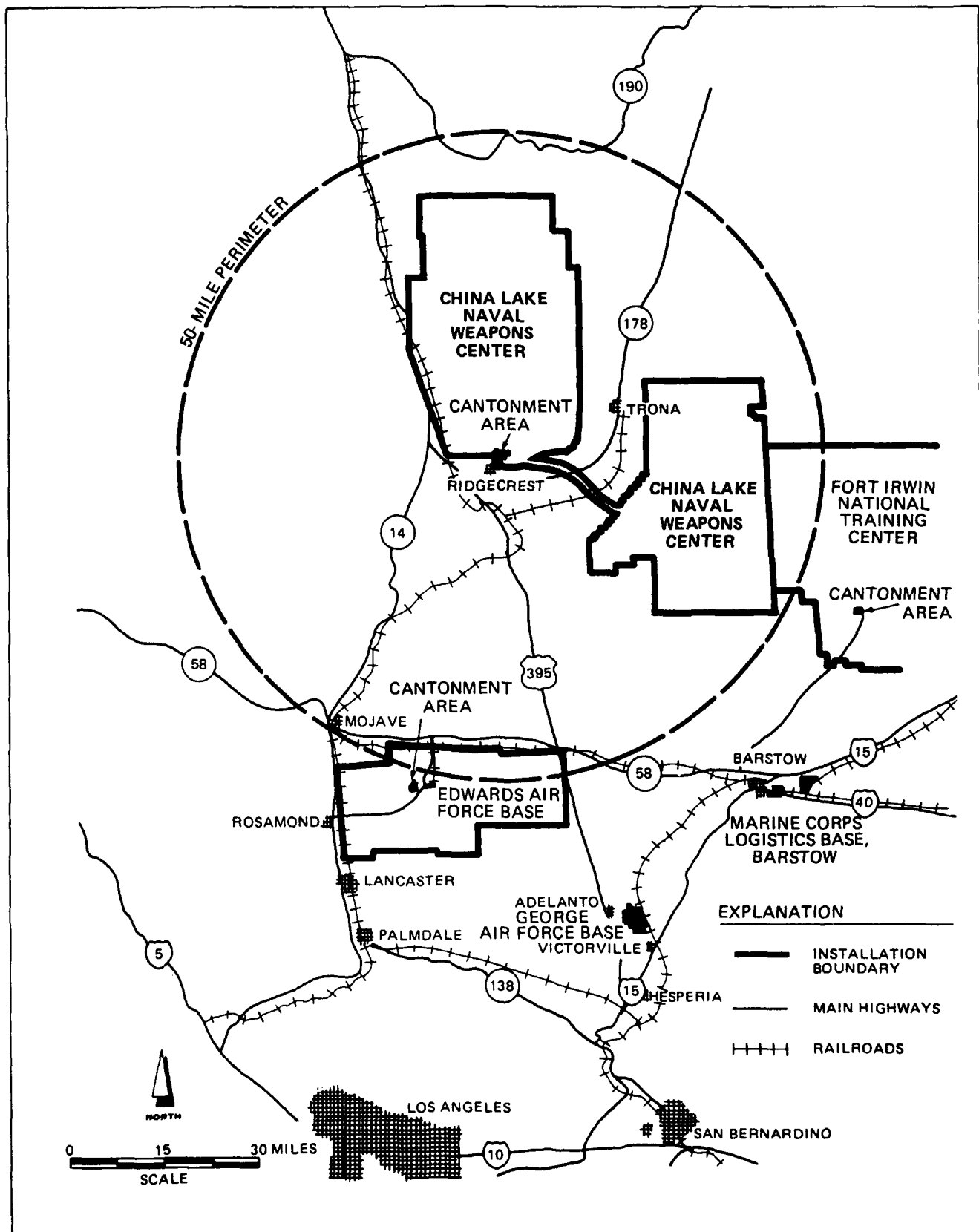
The following sections elaborate on the performance of each Candidate Main Operating Base with regard to the Main Operating Base Evaluative Criteria.

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CHINA LAKE NAVAL WEAPONS CENTER, CALIFORNIA

FIGURE  
E-5-1

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E-5.1 China Lake Naval Weapons Center, California

After evaluating the alternatives for this Complex in relation to each other, China Lake Naval Weapons Center (NWC) was eliminated from further study as a Main Operating Base. Major influences operating determination were the asymmetrical location of the base with respect to the potential deployment area and the limited support services available in the immediate vicinity.

China Lake NWC is located in south-central California, in the northern portion of the Mojave Desert (Figure E-5-1). The base and adjacent range are operated by the Navy and serve as a research, development, test, and evaluation center for air warfare and missile weapon systems, as well as for parachute tests and evaluation. A Main Operating Base at China Lake NWC could support the four Candidate Deployment Installations of the South-Central California Complex.

System Operability: The efficiency of Main Operating Base activities would be degraded by the long distance, approximately 83 road miles, to Lancaster, the nearest community capable of providing a wide range of goods and services. Ridgecrest, with a population of approximately 23,000, is contiguous with the cantonment area but may be unable to provide the wide range of

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goods, services, and facilities required to support the Hard Mobile Launcher mission. The large potential effective area suggests that China Lake NWC could support efficient maintenance and operations. Although the base is contiguous to portions of the deployment area, its distance and asymmetrical location with respect to the deployment areas would reduce the support efficiencies to these areas. The limited military population of about 970 implies that there are minimal existing on-base support facilities and services. China Lake NWC does not expect a reduction in operations that would make these limited facilities more available for the Hard Mobile Launcher mission. Land availability for facilities expansion, including Weapons Storage Areas/Stage Storage Areas, is more than adequate in areas adjacent to the present cantonment area. Currently, 98 percent of the available on-base land is either DoD fee owned or withdrawn for military use.

The utility infrastructure at China Lake NWC appears to be adequate for current base operations, and has a potential capacity for expansion to meet future demands. Electrical power is supplied by Southern California Edison, with capacity sufficient to meet demand for the next few years. Heating is provided by steam-generating plants fired by either gas or oil;

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these facilities are adequate to meet current demand and are believed to be readily expandable. China Lake NWC and Ridgecrest share a single waste-water treatment facility, which is owned by the city but located on the base. This 3.1 million gallon-per-day capacity facility is adequate to handle loads up to 33 percent over present demand. Solid waste is collected by a contractor and disposed of at the Ridgecrest sanitary landfill. This facility would likely require expansion to accommodate the needs of the Hard Mobile Launcher mission. The base storm drainage system consists of a series of ditches, culverts, and diversion structures that are inadequate to prevent flooding. A project to expand and improve the system is currently in progress. Although no surface-water supply is available to meet the increased needs of the base to support the Hard Mobile Launcher mission, ground water may be available via direct development near the cantonment area. Water quality may be locally poor and water may require more than conventional treatment prior to domestic use.

The existing transportation system is good, but some expansion would be required to meet Hard Mobile Launcher mission demands. The base has three partially-instrumented runways with lengths of 10,000, 9,000, and 7,700 feet. Highway access is provided by State Highway 178, which passes the main gate and leads



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to U.S. Highway 395, 6 miles to the west. Rail service is provided by an off-loading facility at the intersection of the Trona Railroad and the Navy Interrange Access Road, approximately 14 miles southeast of the cantonment area.

Because China Lake is a Naval installation used as a weapons test center, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

China Lake NWC has limited support services.

The city of Ridgecrest, with a population of about 23,000, is contiguous with the cantonment area, but can offer only a limited range of goods and services.

Lancaster, the nearest community with a full range of goods and services, is 83 miles from the base. On-base housing, which is considered adequate for present operations but requires modernization, has an occupancy rate averaging 98 percent. In the Ridgecrest area, rental housing units are limited but reasonably priced housing for purchase is available.

Public Impacts: The water demand in support of deployment of the Hard Mobile Launcher mission is expected to have a minimal effect on nearby communities, because sufficient ground water is available via direct development but overdrafting of the basin may continue.

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The Main Operating Base would be contiguous with a portion of the Naval Weapons Center and within a moderate off-base travel distance of the other associated Candidate Deployment Installations. Public safety and security concerns would be increased due to the travel of Hard Mobile Launchers over public roads to reach some deployment areas.

The relatively small urban communities of Ridgecrest and Barstow could be significantly affected if they were to absorb the influx of support personnel and dependents arising from deployment of the Hard Mobile Launcher system at China Lake NWC. Ridgecrest, which is contiguous with the base cantonment area, and Barstow are the only sizeable communities within approximately 60 miles, but both provide only limited goods and services. The majority of the regional population and attendant support services are concentrated over 125 miles from the base, primarily in the communities of San Bernardino and Bakersfield. The level of nonagricultural employment in the region indicates an increased likelihood of average, project-related immigration. Employment in the construction and military sectors is relatively high, which means that new workers will most likely have backgrounds similar to those of the regional resident population. Regional economic diversity is relatively

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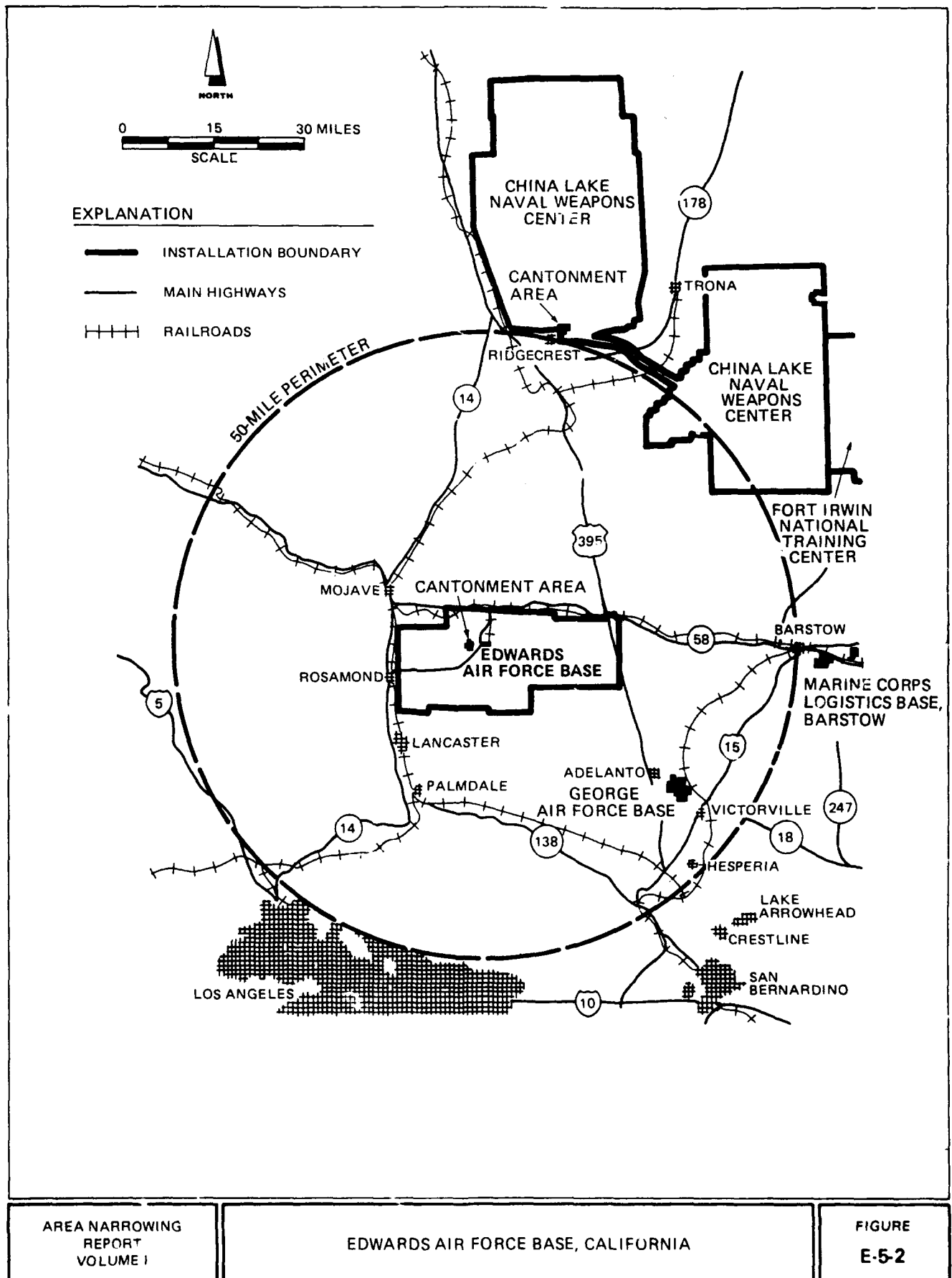
high based on the number of export-producing industries. Local governments may not be able to capture enough tax revenues in the short term, however, to address potential expenditure demands. Housing availability in the region is high. The community of Ridgecrest can provide a moderate number of housing units.

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E-5.2 Edwards Air Force Base, California .

After evaluating the alternatives for this Complex in relation to each other, Edwards Air Force Base (AFB) remains for further, more detailed study as a Main Operating Base. The base has abundant available land for facility expansion; excellent existing air, rail, and highway transportation systems; and good utility infrastructure support capabilities. The Main Operating Base is contiguous with one of the Candidate Deployment Installations, provides a large number of support services, and is an Air Force Base.

Edwards AFB, located in the west-central Mojave Desert of southern California, is approximately 70 road miles from the northern margins of the Los Angeles metropolitan area (Figure E-5-2). Lancaster is approximately 27 road miles southwest of the base. Edwards AFB is currently used as a testing station for aviation equipment and includes a mission to support the space shuttle. A Main Operating Base at Edwards AFB could support the entire South-Central California Complex.

System Operability: The efficiency of Main Operating Base activities would be degraded by the distance (27 road miles) to Lancaster, the nearest community that can provide a full range of goods, services, and

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facilities. The large potential effective area, as reported in the Mission Compatibility Report, suggests that Edwards AFB could provide efficient maintenance and operations. This efficiency would be further enhanced because the base is contiguous to a portion of the deployment area and is somewhat centrally located with respect to all the deployment areas. The large number of military personnel (approximately 4,300) implies that there are many existing on-base support facilities and services for the Hard Mobile Launcher system. However, Edwards AFB does not anticipate a reduction in its future operations that would make these facilities more available for the Hard Mobile Launcher mission. The base contains 300,722 acres of land, which could provide a high degree of flexibility for facility expansion, including new Weapon Storage Areas/Stage Storage Areas. Ninety-nine percent of the available base land is either DOD fee owned or withdrawn for military use.

The utility infrastructure at Edwards AFB appears adequate for current base operations and has potential for increased capacity to meet future requirements. Existing electrical power usage is approximately 44 percent below the maximum capacity of 245.3 million kWH. Gas heating demands are currently 48 percent below the maximum capacity of 10.7 million therms.

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Although the waste-water treatment facility is adequate to meet current demands, the system may need upgrading to accommodate future requirements. Solid waste is disposed of at an on-base landfill that has capacity adequate to meet current needs and has potential for expansion. The storm drainage system consists of open ditches and limited understreet storm drains, which collect runoff and direct it to the Rogers Lake bed. Ground water or surface water may be available through direct development or purchase to meet the increased base demands. Although water quality is not presently a problem, continued overdrafting of ground-water basins could potentially cause ground-water quality to fall below minimum drinking standards.

Edwards AFB has a complete transportation system. The base has a 10,000-foot, fully instrumented runway. On-base rail service consists of 23 miles of active spurs connecting to the Santa Fe Railroad. Two- and four-lane regional highways adjacent to or within a few miles of the west, north, and east base perimeter provide good highway access.

Because the base is operated by the Air Force, the existing personnel and logistic support systems would be compatible with the operations of the Hard Mobile Launcher mission.



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Edwards AFB has good support services, as indicated by the availability of housing and the proximity to a support community. Lancaster, with a population of approximately 55,000, can provide a full range of goods, services, and facilities. On-base housing occupancy is at capacity, but off-base housing is available at affordable rates in the Lancaster area.

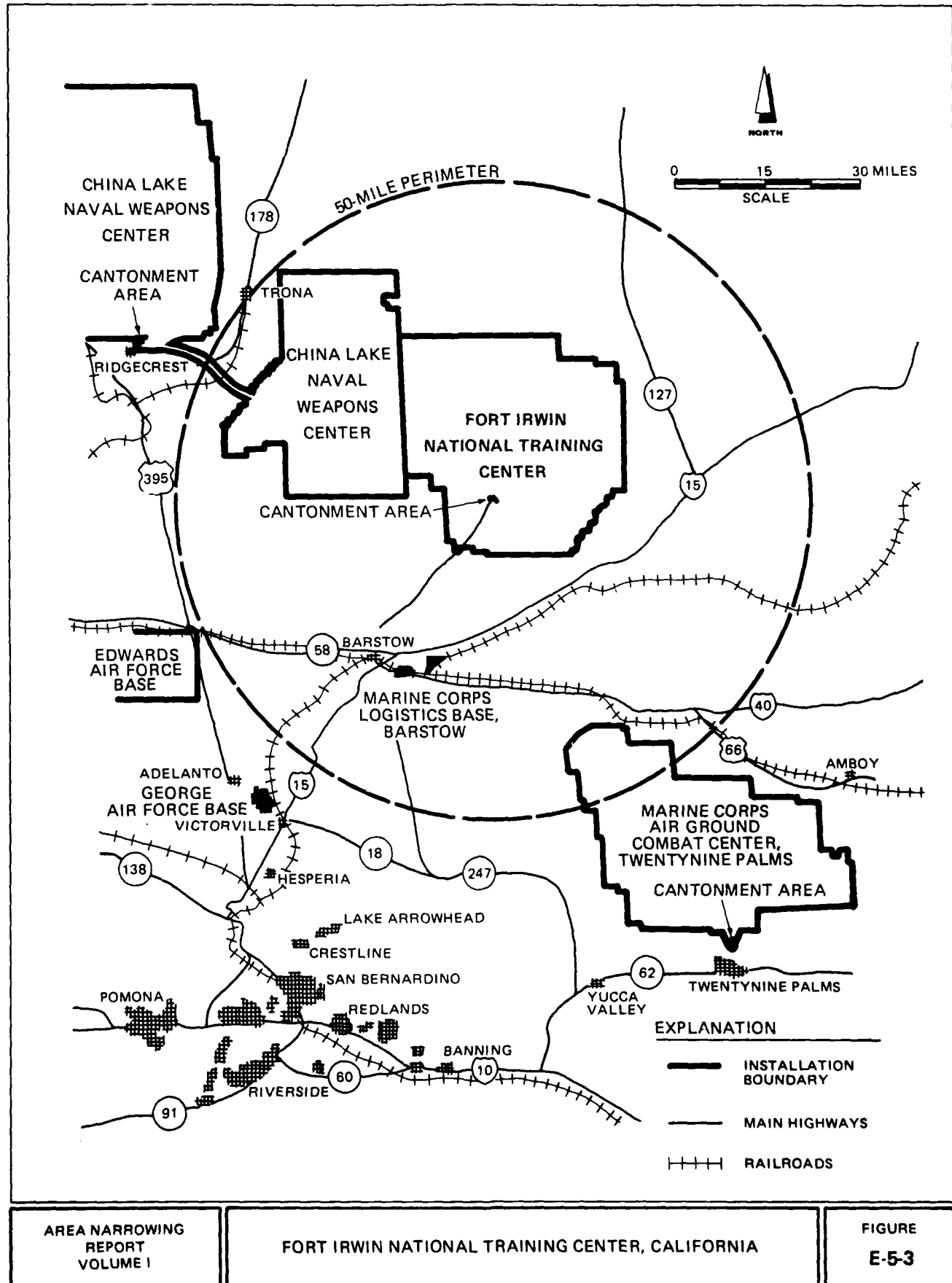
Public Impacts: The effect of increased water demand of an induced work force and their dependents from deployment of the Hard Mobile Launcher system on the support community is expected to be minimal because of the apparent availability of ground water and surface water through direct development or purchase.

The Main Operating Base would be contiguous with the Edwards AFB Candidate Deployment Installation, but there would be a long travel distance to the other Candidate Deployment Installations. Public safety and security concerns would be increased because of the distance that Hard Mobile Launchers would have to travel over public roads to reach some deployment areas.

The large urban population in the three-county region of influence containing the base provides a wide range of goods and services. The region includes the Los Angeles metropolitan area, located approximately 70

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miles south of the base. Nonagricultural employment in the region is relatively high, which would minimize the likelihood of immigration of project-related workers. The area also has a large number of construction and military personnel, which implies that immigrating workers will have backgrounds similar to those of the resident population. The economic diversity of the region, as indicated by the number of export-producing industries in the area, is high. Local governments in the region should be able to capture public revenues in the short term in order to address potential expenditure demands. The support community and adjacent metropolitan areas can provide adequate housing for mission-related personnel.



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E-5.3 Fort Irwin National Training Center, California

After evaluating the alternatives for this Complex in relation to each other, Fort Irwin National Training Center (NTC) remains for further, more detailed study as a Main Operating Base. The base is contiguous with a major portion of the deployment area, has abundant land available for Hard Mobile Launcher system facilities, and the utility infrastructure has favorable expansion capability.

Fort Irwin NTC is located in south-central California, in the center of the Mojave desert, adjacent to Death Valley (Figure E-5-3). The installation is approximately 100 miles from the eastern margin of the Los Angeles metropolitan area. Fort Irwin NTC, an Army installation, is used as a training center for evaluation of battalion and brigade level combat skills and readiness. A portion of the base is used by NASA for the Goldstone Space Communication Complex. A Main Operating Base at Fort Irwin NTC could support the entire South-Central California Complex.

System Operability: The efficiency of the Main Operating Base activities would be degraded if the long distance to the nearest support community is considered. Although San Bernardino, located 103 miles south of the base, is the closest community that could

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provide a wide range of goods and services, the community of Barstow, located 34 miles to the south, can provide some services, and the Victorville-Hesperia area, located 78 miles south, can provide additional services to the base. The large potential effective area, as reported in the Mission Compatibility Report, suggests that Fort Irwin NTC could support efficient maintenance and operations. Efficiency would be further enhanced because the base is contiguous to a large portion of the deployment area and is centrally located with respect to all deployment areas. The relatively large military population of about 3,600 implies that the base could provide a number of facilities and services. The base is currently undergoing extensive renovation to accomplish its assignment as a National Training Center for the Army. The base does not expect a reduction in operations that might increase the availability of its support capabilities for the Hard Mobile Launcher mission. Land availability for facility expansion, including Weapons Storage Area/Stage Storage Area facilities, is more than adequate within or immediately adjacent to the cantonment area. Currently, 91 percent of the on-base land is land withdrawn for military use.

The utility infrastructure at Fort Irwin NTC appears adequate for present base operations, with a potential

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for increased capacity. Electrical power is supplied by Southern California Edison; present system loads average about 95 percent of the 4,980 kilowatt system capacity. Heating is provided by liquified petroleum gas supplied daily via a motor transport from a privately owned plant that has capacity to support a larger demand. The waste-water treatment facility has a capacity of one million gallons-per-day, but is considered only adequate to serve the projected future demand. Solid waste is collected and disposed of in an on-base landfill area projected to have 33 years of remaining capacity. This landfill is considered adequate to accommodate future base requirements. An extensive storm drainage diversion network extending across the slopes above the perimeter of the cantonment area diverts or collects runoff originating outside the cantonment area. Gutters and drainage swales channel runoff from precipitation falling in the cantonment area. Although no surface-water supply is available, it is possible that sufficient ground water is available through direct development from ground-water basins. The Irwin and Bicycle ground-water basins, which currently supply base water needs but are in overdraft, have an expected combined life of between 6 and 25 years. Ground water is of poor quality and may require more than conventional treatment prior to

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domestic use.

Fort Irwin has a limited transportation system. The base has an uninstrumented, compacted sand, 9,500-foot runway located on the Bicycle Lake playa, which is seasonally flooded. Highway access to the base is provided by a two-lane, asphalt paved highway that leads to Interstate 15, approximately 31 miles to the south. The base is not currently served by a rail spur; however, a spur from the Union Pacific main line to the cantonment area has been proposed.

Because Fort Irwin NTC is an Army installation, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

Fort Irwin NTC has limited support services, as indicated by the size and distance to the nearest community and the availability of housing. Barstow, with a population of approximately 18,000, is 34 miles from the base and can provide a limited range of goods and services for base personnel. The nearest community that can provide a wide range of goods and services is San Bernardino, located approximately 103 miles to the south. On-base housing is barely adequate to meet present requirements, but the housing area has sufficient land available for expansion, and

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additional housing is under construction. Housing availability in Barstow is limited.

Public Impacts: The increased water demands of induced immigration of workers and their dependents from deployment of the Hard Mobile Launcher mission could affect local communities. It is likely that sufficient ground water may be available through direct development, but overdrafting may continue. Ground water may be of poor quality in some areas, requiring more than conventional treatment prior to domestic use.

The base is contiguous with the National Training Center and a portion of China Lake Naval Weapons Center, but is a substantial distance from Edwards Air Force Base and the Marine Corps Air Ground Combat Center, Twentynine Palms. Public safety and security concerns are increased because of the distances that the Hard Mobile Launchers would have to travel over public roads to reach some deployment areas.

The urban population of the region is relatively low, implying limited availability of goods and services. Nonagricultural employment in the region is low, which increases the likelihood of immigration of project-related workers. Regional employment in the construction and military sectors is moderate, which



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means new workers will likely have backgrounds similar to those of the resident population. The economic diversity of the region is relatively good based on the number of export-producing industries. Local governments should be able to capture tax revenues in the short term in order to address potential expenditure demands. Housing in the region is available, but the nearest community, Barstow, is not large enough to provide sufficient housing units by itself.

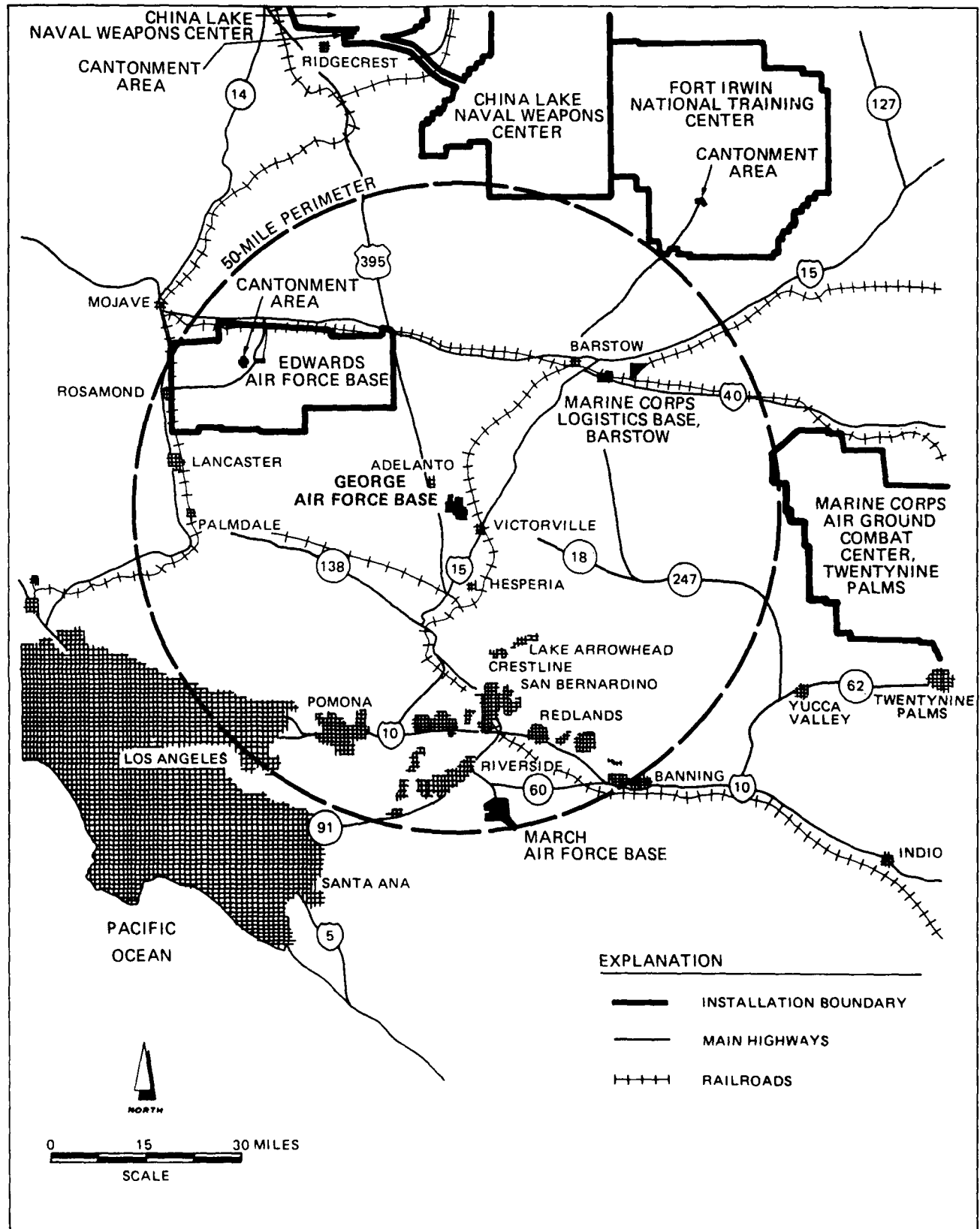
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GEORGE AIR FORCE BASE, CALIFORNIA

FIGURE  
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E-5.4 George Air Force Base, California

After evaluating the alternatives for this Complex in relation to each other, George Air Force Base (AFB) was eliminated from further study as a Main Operating Base. Major influences in this determination were the lack of contiguous deployment area, the limited land available at the base for facility expansion, and the limited support services available in the immediate vicinity.

George AFB is located in south-central California, on the western margin of the Mojave Desert (Figure E-5-4). The installation is approximately 46 road miles north of the San Bernardino area. The base has an existing Air Force Tactical Air Command training mission. A Main Operating Base at George AFB could support the South-Central California Complex.

System Operability: The efficiency of Main Operating Base operations would be degraded by the distance to the nearest support community. The closest community with a wide range of goods and services is San Bernardino, approximately 46 road miles to the south. The Victorville-Hesperia area has some goods and services and the small community of Adelanto, contiguous with the base, has limited services to support the Hard Mobile Launcher system. The large potential effective area, as reported in the Mission

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Compatibility Report, would suggest that George AFB could provide efficient maintenance and operations. However, this efficiency would be reduced because, although the base is centrally located with respect to the deployment areas, there is no contiguous deployment area and the deployment areas are far from the base. The large number of military personnel (approximately 5,800) implies that there are many existing on-base support facilities and services. However, the base does not anticipate a reduction in its future operations that might increase the availability of these support facilities and services for the Hard Mobile Launcher mission. Land availability for facility expansion is adequate, but suitable Weapons Storage Areas/Stage Storage Areas can only be accommodated in the southern portion of the base. Currently, 95 percent of the available on-base land is DoD fee owned.

The utility infrastructure at George AFB appears adequate for current base operations and has the potential for expansion of capacity to meet future requirements. Electrical power is supplied by Southern California Edison; present power usage is approximately two-thirds of system capacity. Natural gas is the principal heating fuel and capacity is believed to be adequate for present demands. A new waste-water

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treatment facility adjacent to the base is co-owned and co-used by the base and the Victor Valley Waste-Water Reclamation Authority. Present base usage is approximately 90 percent of entitlement, but the base allotments can be increased to meet future demand. Solid waste disposal facilities are believed to be adequate for present and projected base demands. The base storm drainage system appears adequate. Runoff is drained by underground pipe drains, street gutters, and open ditches to the Mojave River, located east of the base. Ground-water supplies are available via direct development on base, but continued regional overdrafting of the ground-water basin is likely. However, state regulations do not presently prohibit overdrafting. Water quality may be locally poor and water may require more than conventional treatment prior to domestic use.

George AFB has a good transportation system. The base has two instrumented, concrete runways with lengths of 10,050 and 9,116 feet. Base access is provided by a county road that passes the main gate and leads to Interstate 15, located 3 miles to the east, and U.S. Highway 395, located 2 miles to the west. An unused rail spur runs 5 miles from the main line of the Santa Fe Railroad to the cantonment area; however, the rails have been paved over for roads and parking areas within the cantonment area.

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Because it is an Air Force Base, the existing personnel and logistic support systems at George AFB would be compatible with the operations of the Hard Mobile Launcher system.

George AFB has good support services, as indicated by the size of the support community and the availability of housing. The San Bernardino urban area, with population over 117,500, approximately 46 road miles south of the base, can provide a wide range of goods and services. The Victorville-Hesperia area, with a population of over 30,000, is the closest urban area. The area can provide a wide range of goods and services. Housing in the surrounding area is more than adequate for present needs, but housing within a reasonable distance of the base may be limited. On-base housing is adequate for the existing mission, but would require expansion for an additional mission.

Public Impacts: The effect of the increased water demand of an induced work force and their families from deployment of the Hard Mobile Launcher system on the surrounding communities is expected to be minimal, because of the apparent availability of ground water through direct development, purchase, or water-rights transfer. However, continued regional overdrafting of the water basin is likely. Surface water may be

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available for purchase from the California Aqueduct system. Water would not require more than conventional treatment prior to domestic use.

Public safety and security concerns are increased because the long travel distance from the Main Operating Base to the deployment areas would require considerable travel of Hard Mobile Launchers on public roads.

The relatively small urban communities of Victorville and Hesperia could be significantly affected if they were to absorb the influx of support personnel and dependents arising from Hard Mobile Launcher system deployment at George AFB. However, in spite of the rather long commuting distance, it is likely that the San Bernardino urban area would absorb a portion of the population influx. Nonagricultural employment in the region is sufficiently high to avoid the consequences of immigration of project-related workers. The region has a large number of construction and military workers. This would minimize immigration of workers with backgrounds dissimilar to those of the resident population. The economic diversity of the region is high as indicated by the number of export-producing industries. Local governments throughout the region should be able to capture tax



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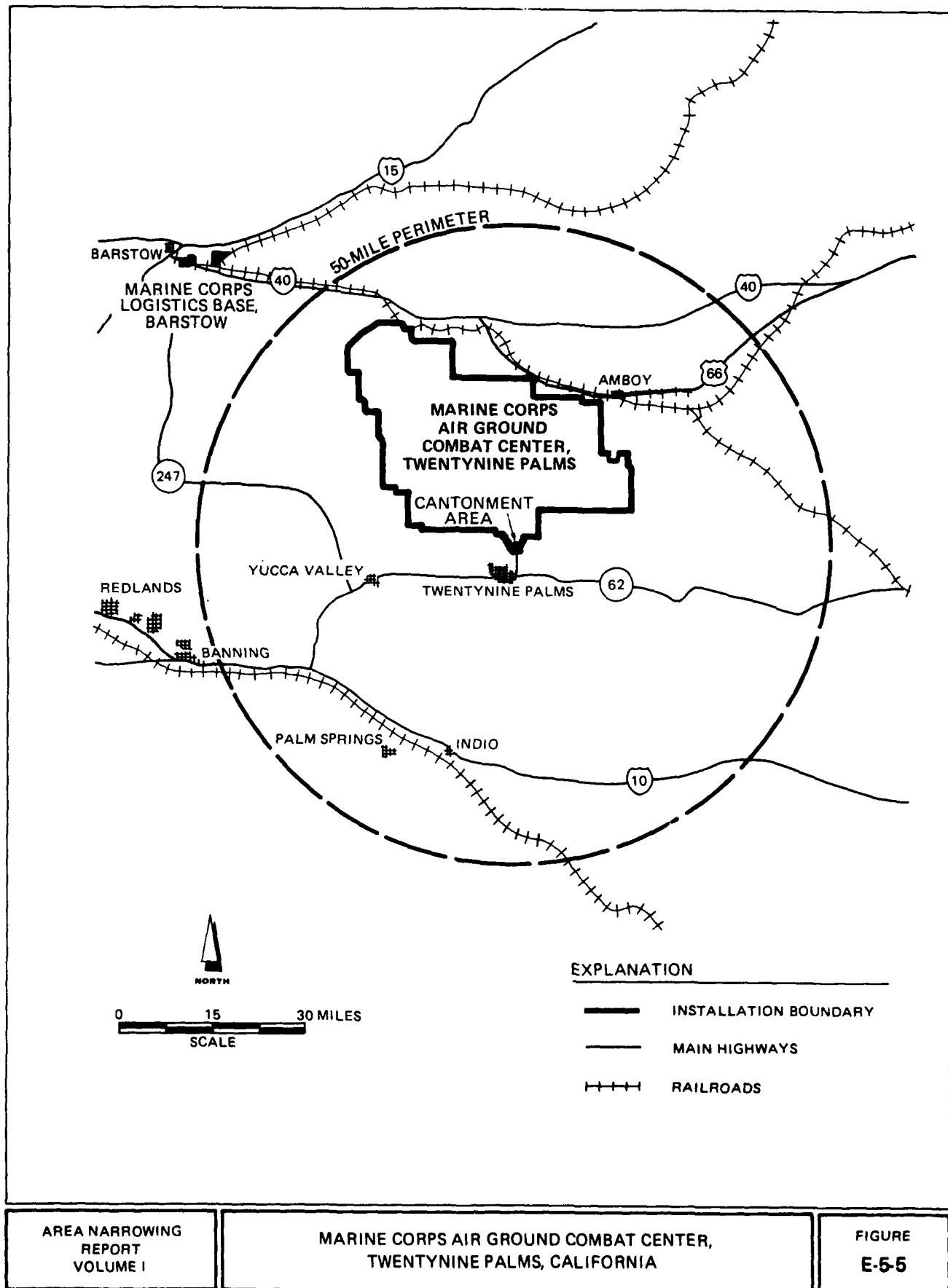
revenues in the short term to address the potential expenditure demands created by deployment of the system. Although there are many available housing units in the region, housing near the base may not be as readily available.

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**E-5.5 Marine Corps Air Ground Combat Center,  
Twentynine Palms, California**

After evaluating the alternatives for this Complex in relation to each other, Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, was eliminated from further study as a Main Operating Base. Major influences in this determination were the base's asymmetrical location with respect to the potential deployment area, a limited transportation system, and limited support services in the immediate vicinity.

MCAGCC is located in the center of the Mojave Desert of southern California, approximately 54 miles north of Palm Springs (Figure E-5-5). The base serves to administer, conduct, support, and evaluate combined arms combat training using all conventional weapons, and includes live ordnance training. A Main Operating Base at MCAGCC could support the South-Central California Complex.

System Operability: Efficiency of Main Operating Base activities would be degraded by the lack of a nearby support community. Palm Springs (population approximately 66,000), located about 54 miles south of the base, is the nearest community with a wide range of goods and services. The nearby small communities of Twentynine Palms and Yucca Valley have limited services. The large potential effective area, as

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reported in the Mission Compatibility Report, would suggest that MCAGCC could provide efficient maintenance and operations. Although the base is contiguous to a portion of the deployment area, its distance and asymmetrical location with respect to all the deployment areas would seriously degrade the support efficiencies to these areas. The large number of military personnel (approximately 8,100) implies that there are many existing on-base support facilities and services. However, the base does not anticipate a reduction in future operations that might increase the availability of these support functions for the Hard Mobile Launcher mission. Land available for facilities expansion, including Weapons Storage Areas/Stage Storage Areas, is more than adequate because the base is contiguous with the deployment area. All of the available land is either DoD fee owned or withdrawn for military use.

The utility infrastructure at MCAGCC appears adequate for current base operations and has a high potential for expanding the capacity to meet future demands. The Southern California Edison electrical power facilities are capable of handling an increased load, possibly as much as double the existing demand. Current usage of natural gas for heating is approximately half of the maximum capacity. Waste-water treatment facilities are

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adequate for current peak demand periods, but may require upgrading to accommodate future growth. Solid waste is collected by a private contractor and disposed of in the San Bernardino County landfill, which has a remaining life of 11 years. The storm drainage system is inadequate to handle major storm runoff; flash flooding has occurred on-base. Although no surface-water supply is available, ground water is likely available via direct development, but overdrafting would continue. Water quality is locally poor and water may require more than conventional treatment prior to domestic use.

MCAGCC has a very limited transportation system. The base has only a temporary aluminum mat runway, which is closed periodically for repairs. A permanent, 10,000-foot runway has been proposed for construction starting in 1990. There is no rail service to the base, but a Santa Fe-Southern Pacific railroad line runs adjacent to the northern base boundary. Base access is provided by local city streets leading to U.S. Highway 62. These streets are subject to occasional flooding.

Because MCAGCC is a Marine Corps base, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

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MCAGCC has very limited support services, as indicated by the distance to a support community and the availability of housing. The community of Twentynine Palms, with a population of approximately 11,000, is within a few miles of the cantonment area, but the city provides only limited goods and services. The nearest community with a wide range of goods, services, and facilities is Palm Springs, 54 miles to the south, with a population of approximately 66,000. The base has a large number of housing units but occupancy rates average 99 percent. The availability of off-base housing is limited.

Public Impacts: The increased water resource demand of an induced work force and their dependents, resulting from deployment of the Hard Mobile Launcher mission, could have an effect on the surrounding community. Although it is likely that ground water is available, overdrafting of the ground-water basin would continue. Ground-water quality may be locally poor, and water may require more than conventional treatment prior to domestic use.

The Main Operating Base would be contiguous with the MCAGCC deployment area, but would be a substantial travel distance from the other associated Candidate Deployment Installations. Public safety and security

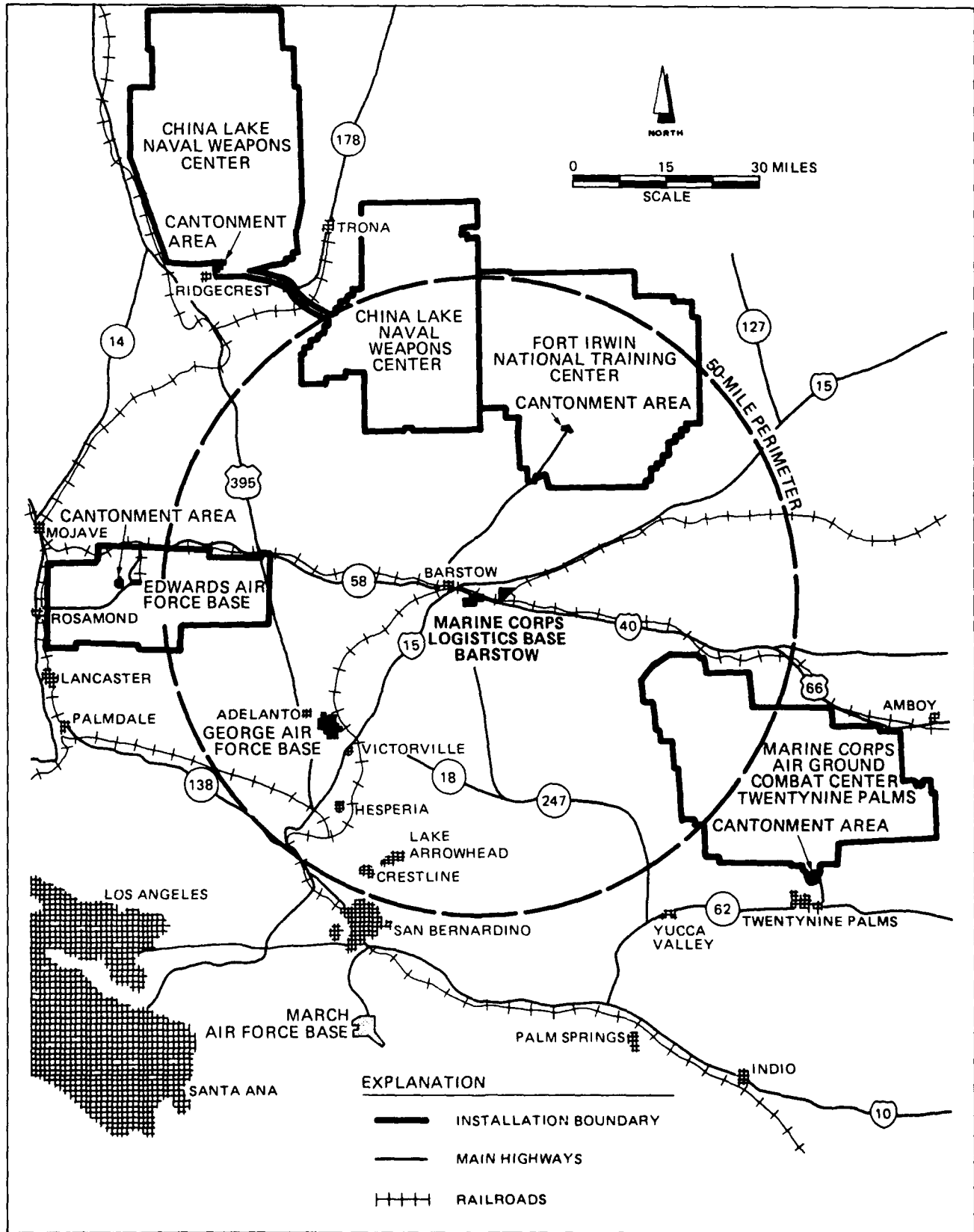
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concerns would be increased due to the travel of Hard Mobile Launchers over public roads to reach some deployment areas.

Deployment of the Hard Mobile Launcher system at MCAGCC could raise social and economic concerns in the relatively small urban communities of Twentynine Palms and Yucca Valley if they were to absorb the influx of support personnel and dependents. These towns are the largest nearby population centers (both with populations less than 13,000). The majority of the regional population is concentrated in the vicinity of San Bernardino, over 70 miles from the base. Nonagricultural employment in the region is moderate, which indicates that immigration of project-related workers is unlikely. Regional employment in the construction and military sectors is relatively high, which would minimize the likelihood of an influx of workers with backgrounds dissimilar to those of the resident population. The local governments in the region should be able to capture some tax revenues in the short run to address potential expenditure demands. The number of available housing units within Twentynine Palms and the immediate area is limited, although there is a relatively high availability of housing in the region.



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MARINE CORPS LOGISTICS BASE, BARSTOW, CALIFORNIA

FIGURE  
E-6-6

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E-5.6 Marine Corps Logistics Base, Barstow, California

After evaluating the alternatives for this Complex in relation to each other, Marine Corps Logistics Base (MCLB) Barstow was eliminated from further study as a Main Operating Base. Major influences in this determination were the lack of a contiguous deployment area, the limited land available at the base for facility expansion, the lack of air transportation support, and the limited support services available in the immediate vicinity.

MCLB Barstow is located in south-central California, about 4 miles east of Barstow and 75 miles northeast of San Bernardino (Figure E-5-6). The base provides equipment maintenance and repair support for the Marine Corps. A Main Operating Base at MCLB Barstow could support all four Candidate Deployment Installations of the South-Central California Complex.

System Operability: The efficiency of Main Operating Base activities would be degraded by the long travel distance (75 road miles) to a community (San Bernardino) that could supply a wide range of goods and services. The Victorville-Hesperia area, approximately 36 miles to the south, could provide many support services. Barstow (population about 18,000), the nearest community, also has some support services and

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facilities for base personnel. The large potential effective area, as reported in the Mission Compatibility Report, would suggest that MCLB Barstow could provide efficient maintenance and operations. However, this efficiency would be reduced, because although the base is centrally located with respect to the deployment areas, there is no contiguous deployment area and the deployment areas are far from the base. The limited military population of about 600 implies that there are few existing on-base support facilities and services. The base does not expect a reduction in its operations that would make these facilities more available for the Hard Mobile Launcher mission. The availability of land for facility expansion, including Weapons Storage Area/Stage Storage Area facilities, is constrained. The land that is available is divided between two widely separated areas that constitute the base complex. All of the land available for facility expansion is DoD fee owned.

The utility infrastructure at MCLB Barstow appears adequate for current base operations, with a potential for increased capacity of most utilities. Existing electrical power, supplied by Southern California Edison, is adequate to meet present base demands. Gas and oil for heating are provided by the Southwest Gas Corporation. The proximity of the base to a nearby

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community suggests that there is potential for expansion of the electrical power and heating systems. Dual waste-water treatment facilities serve the base and have capacities of 3 million and 1.5 million gallons-per-day. The facilities are adequate to meet present demands but may not have excess capacity. Domestic and industrial solid wastes are collected and deposited on base at a 29-acre landfill site believed to be adequate for present and projected base demands, with possible expansion potential. The base storm drainage system is presently inadequate, as evidenced by soil and road washouts during infrequent seasonal storms. No surface-water supply source is available for Hard Mobile Launcher system use. There is potential use further development or additional purchase from existing ground-water sources, but water quality may be locally nonpotable and water may require more than conventional treatment prior to domestic use.

The transportation system at MCLB Barstow is limited by the lack of an on-base airfield. The only airfield in the area is a 6,400-foot runway located at the Barstow-Daggett County Airport, approximately 4 miles southeast of the base. Highway access is provided by Interstate Highways 15, to the north, and 40, to the south. Railroad lines that run through the northern

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portion of the base and along the eastern edge of the base are owned by the Santa Fe and Union Pacific railroads, respectively. The base is served by 23 miles of rail spurs.

Because MCLB Barstow is operated by the Marine Corps, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

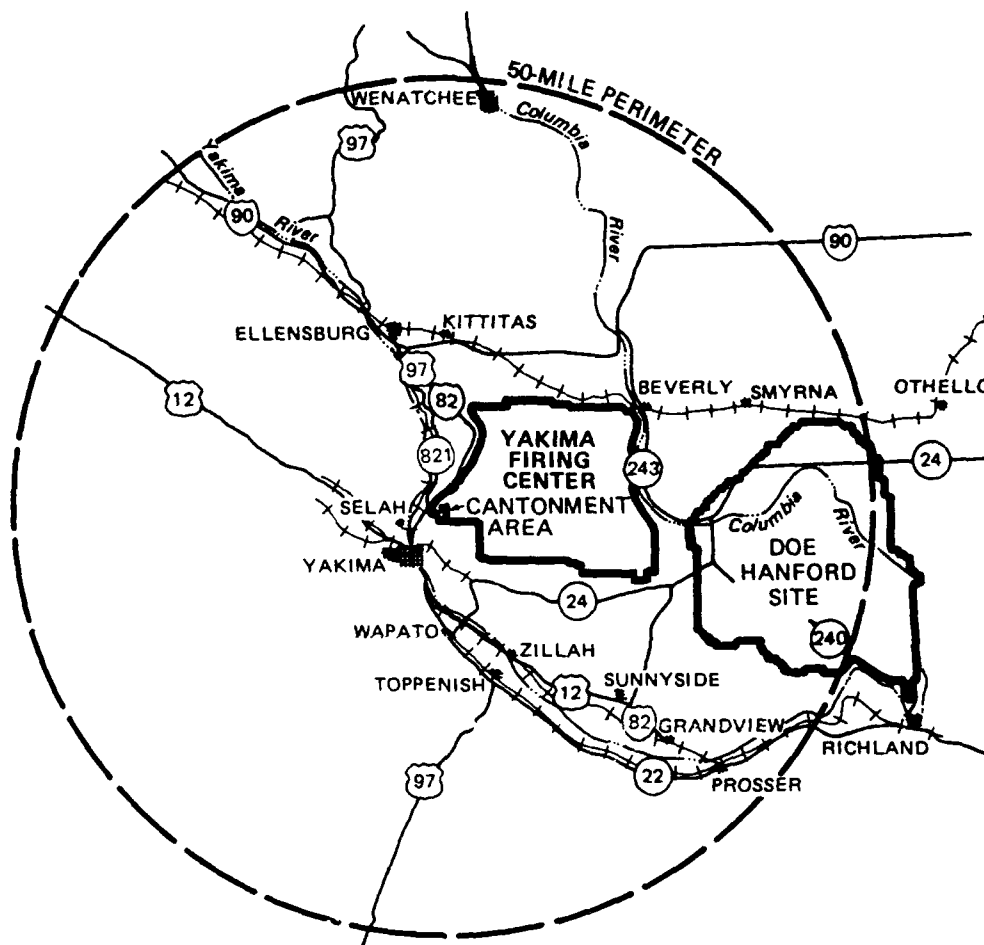
MCLB Barstow has very limited support services, as indicated by the availability of housing and the distance to a support community. Housing availability on the base and in the surrounding communities is limited. Barstow, the nearest community, has some support services and facilities for base personnel. However, San Bernardino, approximately 75 miles south of the base, is the closest community that could provide a wide range of goods, services, and facilities to support the Hard Mobile Launcher mission.

Public Impacts: The water demand in support of deployment of the Hard Mobile Launcher system could affect the Barstow area. Although sufficient ground water may be available through new development or additional purchase of existing supplies, overdrafting would continue. Also, water quality is poor in some areas, and this water would require more than conventional treatment prior to domestic use.

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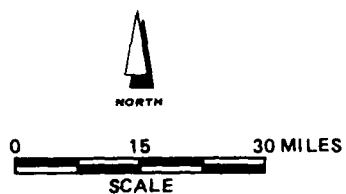
Public safety and security concerns would be increased because the long travel distance from the Main Operating Base to the deployment areas would require considerable travel of Hard Mobile Launchers on public roads.

The urban population of the region is relatively high, implying that it can provide many goods and services. Nonagricultural employment is also high, which decreases the likelihood of immigration of project-related workers. Enough construction workers and military personnel are already in the region to ensure that any new workers will likely have backgrounds similar to those of the existing population. Compared to other areas examined, the region has the highest number of export-producing industries, which indicates considerable economic diversity. Local governments throughout the region have been able to capture tax revenues in the short term and could continue to address potential expenditure demands. A considerable amount of housing is also available in the region. However, the nearest community, Barstow, cannot provide all the goods and services or housing needed.



EXPLANATION

- INSTALLATION BOUNDARY
- MAIN HIGHWAYS
- RAILROADS



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WASHINGTON COMPLEX  
YAKIMA FIRING CENTER

FIGURE  
E-6

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E-6 Washington Complex

Following application of Main Operating Base Exclusionary Criteria and Deployment Installation Evaluative Criteria, Yakima Firing Center remains as the only Candidate Main Operating Base within the Washington Complex (Figure E-6).

Subsequent application of Main Operating Base Evaluative Criteria resulted in the determination that Yakima performed acceptably with regard to the criteria, and therefore remains as a Candidate Main Operating Base. However, no determination is made at this time regarding the advisability of using this Army installation to support an Air Force mission.

The following section elaborates on the performance of Yakima Firing Center with regard to the Main Operating Base Evaluative Criteria.



E-6.1 Yakima Firing Center, Washington

Yakima Firing Center(FC) remains for further, more detailed study as a Main Operating Base. Yakima FC is the only Main Operating Base that can support the Candidate Deployment Installations in this region. The Main Operating Base has sufficient water resources and land available for mission and facilities expansion. The utility infrastructure is adequate and the highway transportation system is good.

Yakima FC is located in south-central Washington, 7 miles north of the city of Yakima and approximately 150 miles southeast of Seattle (Figure E-6). The base is a subinstallation of Fort Lewis, located near Tacoma, Washington. Yakima FC is used for weapon systems training for various branches of the Armed Services, but principally for the Army. The Main Operating Base at Yakima FC could support the Department of Energy Hanford Site and Yakima Firing Center Candidate Deployment Installations.

System Operability: The efficiency of the Main Operating Base activities would be enhanced by the distance to Yakima (7 road miles), the nearest support community that could provide an adequate range of goods and services to the base. The low operational efficiency at Yakima FC, which is at the minimal

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acceptable level because of the small potential effective area, is somewhat offset because the base is contiguous to one deployment area and close to the other. The apparent ability of the base to provide only limited support services and facilities for the Hard Mobile Launcher system is implied by the small number (approximately 170) of assigned military personnel. No reduction in base operations is anticipated that might increase the availability of these existing limited facilities and services for the Hard Mobile Launcher mission. Sufficient land is available in or adjacent to the existing cantonment area for facility expansion including new Weapons Storage Area/Stage Storage Area facilities. Available land on the Main Operating Base is principally DoD fee owned.

The utility infrastructure at Yakima FC appears adequate for current base operations and has potential for expansion. Electrical power is supplied by the Pacific Power and Light Company. Present electrical power usage is only 25 percent of capacity. Natural gas is supplied by the Cascade Natural Gas Company and is the primary heating source on the base, although some fuel oil is used. The natural gas system appears adequate for current operations, and has excess capacity for future requirements. The waste-water

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treatment plant has a capacity of 43 percent over current peak usage. The existing solid waste landfill is adequate for present needs with several years capacity remaining before additional facilities are needed. The storm drainage system appears adequate for existing facilities. Sufficient supplies of good quality surface and ground water are available in the area for Hard Mobile Launcher system requirements.

Yakima FC has a limited transportation system. The main airfield has an uninstrumented runway of only 2,000 feet. An instrumented 7,600-foot runway is located 8 miles to the south at the Yakima Municipal Airport. Grant Airport, located 55 miles northeast of the base, has a 13,500 foot instrumented runway. There is an excellent roadway system: Interstate Highway 82 provides direct access to the Main Gate and Interstate Highway 90 and U.S. Highways 243 and 24 encircle the base perimeter on the north, east, and south sides, respectively. Rail access is provided by Burlington Northern Railroad, with a siding 3 miles west of the base cantonment area.

Because Yakima FC is an Army installation, the existing personnel and logistic support systems would need to be augmented to become compatible with Air Force operations.

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Yakima FC has good support services, as indicated by the size and proximity of the support community and the availability of housing in proximity to the base. Yakima, the nearest support community, has a population of about 81,000 and can provide a wide range of goods and services. Yakima FC has no on-base housing, but sufficient and reasonably priced housing is available in the surrounding area.

Public Impacts: The effect of increased water demand resulting from deployment of the Hard Mobile Launcher system on the support community is expected to be minimal because there are sufficient surface-water and ground-water supplies of acceptable quality in the area.

Although the Main Operating Base is contiguous to the Yakima FC deployment area, the base is within a short travel distance of the DOE Hanford Site. Some public safety and security concerns could be raised because the Hard Mobile Launchers would have to travel over public roads to reach the DOE Hanford Site.

Although the nearby city of Yakima can provide a wide range of goods and services for base personnel, the outlying areas of the ten-county region of influence around Yakima FC have a limited range of goods and

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services for support of system construction and operation. Nonagricultural employment in the region is also low, which increases the likelihood of immigration of project-related workers. The regional employment in the construction and military sectors is low, which means that immigrating workers are likely to have backgrounds dissimilar to those of the resident population. The region appears to have good economic diversity, as indicated by the number of export-producing industries in the area. Local governments in the region may not be able to capture tax revenues in the short term to address potential expenditure demands. Housing availability in the region is limited, but there is sufficient housing available in the vicinity of Yakima.